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GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CLXX. No. 3238.] LONDON, JUNE 3, 1925. [77TH YEAR. PRICE 1s.

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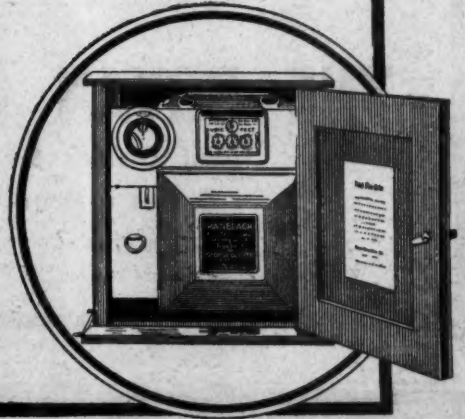

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VOL. CLXX., No. 3238.] WEDNESDAY, JUNE 3, 1925. [77TH YEAR.

INSTITUTION MEETING | **A complete account of the week's proceedings will appear in the single issue of the "JOURNAL" published on June 17.**

EDITORIAL NOTES.

More Interest for the Institution Meeting.

As the days pass, the arrangements for the annual meeting of the Institution of Gas Engineers gather more and more interest. The prospect is that numerically the meeting will be equal to the best of records. The acceptances for functions and visits show this. For example, those who have signified their intention of visiting either Fulham, the South Metropolitan Chemical, Physical, and Burner Laboratories, or the National Physical Laboratory on Thursday afternoon total something like 450; and the President (Mr. J. Ferguson Bell, M.Inst.C.E.) and his Chairman and Directors will have the felicity of welcoming to Derby on the Friday approximately 420 visitors. At the opening meeting, the expected attendance is between 600 and 700. A number of distinguished visitors as well as members from overseas will also be present; and they will have a warm reception from the members who carry on the work of the industry at home. On behalf of the visitors, there will be response to the welcome of the President by the Rt. Hon. J. H. Thomas, M.P., the Rt. Hon. Sir Alfred Mond, President of the Society of British Gas Industries, and Mr. W. Woolley (Chairman of the Derby Gas Light and Coke Company); and on behalf of the overseas visitors, the Hon. George Swinburne, of Melbourne, will reply. Among other matters of outstanding personal interest will be the presentation of the Birmingham Gold Medal to Dr. Charles Carpenter, C.B.E., M.Inst.C.E.; and the members will take advantage of this opportunity to give expression to their unanimous views as to the invaluable work over long years that Dr. Carpenter has accomplished for the gas industry. The winners of diplomas in the recent Institution examinations in Gas Engineering will be personally presented with their certificates at the meeting; and they will have the further reward of receiving the massed congratulations of the members. The names of the successful diploma candidates are given in later columns. The technical programme for the meeting, with other features, have been previously dealt with; and elsewhere to-day we publish the Council's annual report, which shows a year of great activity, with resulting additions to knowledge beneficial to our industry.

The Campaign.

THE gas industry is heading a campaign—not only in its own interests but in those of the nation, and, we verily believe, of the electricity supply industry. It was opened by Mr. D. Milne Watson, in the Presidential Address to the Society of British Gas Industries which we reported and commented upon last week; and it was continued by him, with further effective point, in the address which he delivered at the annual meeting of the National Gas Council yesterday week. We cannot have too much criticism, nor too much publicity, in respect of this urgent and momentous matter of the intentions of the Government in regard to electricity. Right at the initial stages of this campaign, however, it is necessary to proclaim frequently and widely that the gas industry has no fear of, and, of course, it has no valid objection to, the development of the electricity industry by its own exertions, merit, and resources; but the position has been transformed by the prospect of legislative preference and State aid, and that on altogether chimerical grounds. The situation is such that any scheme which the Government may propose, if State aid or legislative preference is involved, must be resisted to the fullest extent of the power of the gas industry; and more particularly as not a particle of national advantage has been or can be shown. On the contrary, in view of the absurd emanations of certain political imaginations, the prospect is a distinct national disadvantage, which in its incidence will seriously involve the gas industry as taxpayers and competitors of the electricity industry. Competition on level terms is an excellent thing; if the Government throw their weight on one side to the detriment of the other, they will be doing something which is both unjust and unwise. There is a possibility upon which there has not been any direct comment: It is, if experience should show that harm instead of benefit has been imposed by statutory process and State aid upon the electricity industry, its patrons, and the country, will there then be further relieving subsidies from the Government? That is a possibility which must not be overlooked.

The objections of the gas industry can be based on five grounds: (1) That, in view of the statements of ministerial spokesmen, the Government are wrong in their premises; and that the expected good effects upon industry and unemployment cannot result from their proposals. (2) That assuming the Government are right in their premises, then the granting of statutory preference and State aid for one competitor as against another is altogether wrong. (3) That if the Government are in error, and the results anticipated by them do not accrue (to the financial detriment of the electricity industry), will increased State aid be allowed by way of relief? (4) That the development of electricity supply in the directions indicated will be a national disadvantage from the point of view of the conservation of our coal resources. (5) That the Government have not considered the whole problem of the national provision of power and heat from the standpoints of the conservation of coal and the national co-ordination of the use of fuel. There are plenty of substantial reasons why the administrators of gas undertakings should strongly support their leaders on the National Gas Council by using every available opportunity, and all influence they possess, to make public the mischievous trend of things through the gravely mistaken policy of the Government. It is true that even now we do not know what is in the Weir report; but the speeches that have been made by responsible members of the Government disclose an intention upon which it is sufficient to act, and that promptly. We are glad to note that already there are indications of somewhat less confidence as to the pro-

priety and soundness of what has been in the minds of the politicians; and there are members of the electrical industry who have been speaking and writing in no uncertain way much along the lines taken by Mr. Milne Watson in his addresses on the subject.

The deliverance by the President at the meeting of the National Gas Council may be taken as supplementary to the one at the meeting of the Society of British Gas Industries. In the latter, as we showed last week, he advanced ample evidence to cause those who are pushing this question of State aid for developing the electricity system of this country to pause (if prudently inclined) and reconsider their position and attitude. But when one takes the two addresses in conjunction, the evidence becomes absolutely overwhelming against the proposals of the Government. If these showed any intrinsic national benefit, there could not be the same degree of objection to them, but, as a matter of fact, they do not. Furthermore, they ignore entirely the services of the gas industry in a country where coal is the prime asset, and in the use of which this industry has been more successful than any other in meeting the needs of the community. In doing this, it has also done more to conserve our valuable coal supplies, and put them to better use, than any other process existing or in prospect. There must therefore be insistence upon full recognition being given to the point so frequently made in our columns, that coal, power, and heat are questions and present problems which are inextricably bound together, and should be considered in their entirety with the whole range of provision and utilization. In this connection, it may be asked, is the cost of obtaining electric power excessive? The answer is "No." Is the cost of obtaining heat by electricity excessive? The answer is "Yes; and it is a most uneconomical proceeding." Yet the Government appear to be unaware of the fact, and so are the public, excepting those who have tried electric heating, and have discarded it save for very occasional and never continuous use. For industrial power purposes, the President points out, electricity here is as cheap as it is in Chicago, and twice as cheap as in Switzerland; and in any case it only represents something like 1½ p.ct. of the total manufacturing costs—indeed, in a representative engineering works of which he knows, power only represents 0·8 p.ct. of the total manufacturing costs.

Resentment is being shown in the electricity industry over the suggestions made by political leaders that the costs of electrical power are too high. We can understand the feeling, in view of the remarkable gap there is between electric power and lighting charges for reasons of expediency. The "Electrical Times" has denied the Prime Minister's statement that the country is "paying too much for its light and power." And as to the effect of power costs on industry, a correspondent of "The Times," who signs himself "B," and is manifestly an electrical man, asserts that while in some industries "the cost of electrical energy is the paramount item, in others it is an appreciable item, but in many industries, if the electricity were given away, it would not make one-half of 1 p.ct. difference in the selling price of the finished product." The same writer asks why the electricity industry has left it to the gas industry to proclaim these elementary truths from the housetops; and he speaks of the danger of the country being stampeded into a vast expenditure of public money for which no case has yet been made out. Again we have Mr. C. Nelson Hefford, the Engineer of the Leeds Corporation Electricity Department, writing to the "Yorkshire Post," urging that an attempt should be made to stimulate public interest in what is developing at Westminster in respect of electricity. He criticizes strongly the false hypotheses upon which the proposals are based. Among several other pertinent points he states that in our large generating stations, whether publicly or privately owned, there is very little margin to-day for any possible saving; and he sees retarding consequences rather than aids to progress in the artificial development of large stations beyond the natural economic demand. Like many other competent men he cannot see whence the wonderful economies are to come. In the President's address at the National Gas Council meeting, there is further evidence as to men in high places in the electricity supply industry viewing the proposals of the Government with anything but enthusiasm—rather with scepticism and dismay.

The points in the address as to the costs of current, consumption per head in comparison with other countries, unemployment, &c., accentuate what was said in the prior address, and demonstrate beyond any contradiction that the Government are following something that is very illusory. So much so that electricians are asking why these matters are not being exposed by the electricity industry, instead of the gas industry. It seems to us (as previously remarked) that the gas industry has taken up a current piece of work—inaugurated so well by Mr. Milne Watson—which is not only in its own protection, but in that of the electricity industry, and the nation at large. But for some inexplicable reason the leaders of the electricity industry appear to be accepting the position lying down, probably regarding the hoped-for State aid as being some compensation for all else not so pleasant that will follow when people awaken to the fact that—presuming the scheme matures—the Government have been misled, and the golden egg turns out to be something wholly fictitious. We hope that all who are interested in these two addresses will read and make use of them as widely as possible, so that the misconception that exists and the truth of the matter may be broadcasted everywhere. This is no time for sitting idle and allowing things to take care of themselves.

Getting and Keeping the Business.

ONE of the main objects of the District Conferences of the "B.C.G.A." is local publicity. They serve that purpose magnificently in a large radius from the place of meeting. Gas men find they also yield a splendid crop of suggestion and encouragement—no matter whether the individual is engaged in a large or a small concern. This applies to the Minehead and Harrogate conferences, just as it did to those which preceded them. The Minehead Conference was reported a fortnight ago; the Harrogate one in the current issue. As the reports are read, and what they reveal in actual accomplishment is noted—good accomplishment in totally different walks in our industry—we cannot refrain from a little amusement as there comes to mind those of our competitors who examine us through densely coloured glasses or through the wrong end of a telescope, and those political dispensers of favours who appear to be seriously ignorant of the existence and activities of the gas industry, but are of opinion that the electricity industry is in much need of their benefactions. Just consider the mammoth expansion figures given at Minehead by the President of the "B.C.G.A." (Mr. J. H. Ellis, Chairman of the Plymouth and Stonehouse Gas Company), which showed that in statutory areas the output of gas in 1924 increased by 12,272,000,000 c.ft., the number of consumers by 95,897, and cookers and grillers by 316,903. To those increases little Minehead made its contribution, as did popular Harrogate, and all the big, medium, and small undertakings of the United Kingdom, despite the frantic efforts of electricity to take from gas part of the domestic load; and, through local influence and not merit, the lighting of streets and public institutions.

Those of our readers who have perused the paper by Mr. Edwin P. Vince, the Manager and Secretary of the Minehead Company, must have been struck and pleased by the high standard of trading policy which that Company prove can be as advantageously adopted by the smaller undertakings as by the larger ones. The Company, with admirable vigour, do their part in the common cause, and apply all things that are beneficial to its business, precisely in the same way as the larger concerns which are progressively directed, with the result that since 1897 they have multiplied their gas sales six times. In that year the consumption of gas was 8 million c.ft.; last year it was 48 millions. Those figures induce one to reflect upon the power, even within limited circumstances, of wise administration. Mr. Vince's paper may be taken as a rebuke to those managements of small concerns who in respect of policy hang back in the shadows of the past. From the statements in the paper, we see nothing missing that is part of the administrative policy of the best of our progressives. And this small Company find it

pays. When we see that 500 houses have been erected in Minehead since the Armistice, and that all of them, except two, have been piped for gas, and the pipes so arranged that gas fires can be fixed in any room, there is as lively satisfaction over the evidence of a go-ahead policy, as there is in learning from Mr. Westlake that, in 95 p.ct. of the houses erected in the dear old city of Exeter in the past four or five years, the extravagant piece of kitchen equipment, the coal range, has not been adopted, but the more efficient, cleanly, non-smoke-producing gas cooker has been installed instead. It must be that our builders and architects are at length being converted to the idea that building economy and modern house efficiency through gas utilization are congenial companions.

To the maintenance of the marvellous purity of the air at Harrogate, we find, from the paper by Mr. Frank H. Robinson, at the conference in the town last Thursday, that gas and coke make excellent contribution. We dare not attempt to imagine what the air of the town would be like if the Company's 11,000 consumers were to return to coal for cooking and heating. We often talk of the good part gas has taken in minimizing the pollution of the atmosphere; but we know there are still nearly 40 million tons of coal used for domestic purposes in this country. The products of combustion from that quantity of coal are a terrible air-polluting affliction; but if it be possible just try to visualize what the conditions would be if the 5½ million gas cookers and grillers did not exist in the British Isles, as well as gas-fires which have never been enumerated. The paper shows the practical unanimity of hotel and boarding-house proprietors in Harrogate in utilizing gas for cooking, coke for central heating, steam-raising, &c., and prepayment metered gas-fires for bedrooms. In the kitchens of establishments where catering on the large scale is carried on, flexibility, cleanliness, reliability, and promptitude are essentials in the appliances used; and gas-heated appliances have all these virtues. As to gas-fires with slot meters attached, the paper shows that the hotel and boarding-house proprietors can get 10 p.ct. on the capital expenditure. In the Harrogate boarding schools and colleges, the equipment is much the same as in the hotels. System is applied in maintaining the good reputation of gas in these large establishments. Before the commencement of the holiday season, the appliances in the hotels and boarding houses are examined, repaired, and adjusted by the Company. Before a term begins at the schools and colleges, the gas apparatus in them is consistently overhauled. At all times, too, fitters are available to keep the appliances working at full efficiency. No charge is made for advice and regulating the appliances; only for repairs, cleaning, and overhauling. And Mr. Robinson finds there is plenty of room for developing service, to the advantage of both the Company and the proprietors of the establishments. The paper contains much suggestive material for those engaged in gas supply in our seaside and inland resorts.

Plant Design and Control.

A MATTER which has large importance in the economy and efficiency of gas plant was introduced in an address by Dr. Geoffrey Weyman to the recent auxiliary meeting of the North of England Gas Managers' Association. This is an age of plant standardization, which is all very well up to a point, but it has the drawback that it does not take into the reckoning variations in local conditions. A standardized plant may, in a situation with local conditions wholly appropriate to it, work splendidly under proper control; but change the conditions, and the same plant may not give nearly such a good account of itself. The address is one which will be considered by both manufacturers and users; and the former will no doubt have a very good case to put up against part of Dr. Weyman's submissions. For example, standardization—instead of the manufacturer having to work to new designs each time—may mean a material saving of capital charges, and also money economy in reconstruction and repairs. On the other hand, the working economies and efficiencies of a specially designed plant to suit local conditions may more than wipe out any additional capital, renewal, or repair charges. It is a controversial point, and one which it is apparent can only be settled by a consideration of the circumstances of each case. We are not going so far as to support Dr. Weyman in his assertion that, when once a plant has been evolved and placed on the market, the manufacturers often lose touch with the small details which contribute so much to successful results. They may do so sometimes; but looking at the history of plant evolution, we have frequently been surprised at the rapid response made by the manufacturers to requirement. Moreover, we have also been aware that the diversity of conditions under which they have to construct plant, and the varied knowledge they gain through contact with different engineers and the recounting of experiences, are frequently the means of bringing about the introduction of improvement. Therefore, we should prefer the "often" in Dr. Weyman's modest indictment to be modified.

Again, it is not always true that the only party really in a position to appreciate the problem and to formulate an economical plant is the user himself. One's point of view is largely guided by experience; and Dr. Weyman views things from the standpoint of one whose professional experience has been in a works staffed by high qualifications. There are engineers and engineers. There are engineers who are assisted by men who know every detail of a works' requirements. The wise chief takes them into his counsel. There are others whose opportunities are not of the same order, and who are not so fortunately placed. Many plants are new to some engineers; and it is an excellent thing for them that the manufacturers can come to their assistance with experience. Dr. Weyman's assertion as to "the only party really in a position to appreciate the problem and to formulate an economical plant is the user himself," cannot apply to such engineers; the best thing for them to do is to recognize that there is another party with knowledge, co-operation in which is valuable. While saying this, there is agreement with the point made that in recent years the education and the training of technical staffs in the gas and other industries has been greatly improved; but, again, it depends on circumstances whether "there is no adequate reason why the design and arrangement of plant should not be systematically considered, and the plant makers be given the necessary plans and specifications which would enable them to put forward plant which is suitable in design and convenient in arrangement for each particular set of circumstances." That requires qualification. "Local conditions" apply to men and knowledge, as well as to situation and raw materials.

But the little difference we have with our Newcastle friend's opinions really only extends to their modification in respect of dissimilar conditions. They are justified in some circumstances, but are not universally applicable. However, there is much else in the address with which there can be absolute concurrence. It may be agreed without reservation that designing a plant best to suit local conditions requires imagination. Its capacity or productive quantity is not the only consideration. One needs to design with a mental picture before him of the conditions under which the plant will be working. Overall efficiency and economy are desiderata. Men cannot work to the highest efficiency unless the conditions for doing so are favourable. There cannot be the satisfactory control that is necessary unless provision is made of accessible positions for the points at which the controlling operations are to be performed—operations involving testing or regulation. Inaccessibility involves labour and time, and engenders a proneness to shirk the work. In designing plant this can be avoided by a little imagination, visualization, or forethought. This has increased importance with the more modern types of plant than with those of earlier days. They have become more intricate, and so has their operation. These facts and the modern conditions of supply make ease of control and accessibility to the point of control real essentials. No one will dispute Dr. Weyman's declaration that if plant is to work with maximum economy, it is necessary to know both when it reaches that desirable level, and the conditions under which this state of affairs can be maintained. Control being imperative to success, it is ridiculous not to consider the provision of the necessary facilities for it at the time the plant is designed, rather than apply them as an afterthought. They are the assurances of

making the money invested in the plant realize the greatest profit. But here again Dr. Weyman says: "It has always been a wonder to me that makers of plant should allow units which they are anxious should be an economic success to be installed without any means whatever of ensuring by proper control that they are so." With that there is agreement. But is it not also a matter for surprise that, if the "only party really in a position to appreciate the problem, and formulate an economical plant is the user," he should allow plants to be erected without facilities for proper control? The user must also be anxious that the type of plant he has recommended shall be an economic success.

There are many other points in the address which will arrest the interest of those whose work is to design plants, or to see that the design is such as to secure and maintain maximum efficiency. The treatment of coal with the view to obtain uniformity of the raw material is one. Dr. Weyman says that there is no doubt a considerable proportion of capital ought to be devoted to this object, as true economy cannot be realized in the retort-house if the coal used is varying from retort to retort and from hour to hour. That must be decided on the basis of the relation of costs to effects. In this connection he also urges, in view of recent investigations, the consideration of the inclusion of blending plant for properly mixing charges with coke breeze or non-caking material. We cannot help thinking that there is much to be done in this way, with the dual object of improving heat transmission through retort charges and enhancing the physical characteristics of coke.

Coke Competition.

June 30 is the last day for the delivery of papers to the Editor of the "JOURNAL." Particulars and conditions were given in the "JOURNAL." for Feb. 18. The prizes total to £1000.

National Gas Council.

In an editorial article, reference is made to the address of the President (Mr. D. Milne Watson) at the meeting of the National Gas Council; but on this occasion the comment is confined to the subject which is raising concern in the minds of a good many men in the country—that is, the intention of the Government in regard to what they apparently believe will secure the development of electricity supply and, through it, the interests of the country. In considering this supremely important matter, sight must not be lost of the vast amount of work which has engaged the attention of the Council during the past year, as revealed by the annual report published last week, and the introductory remarks of the President at the meeting. But great and important as has been that work, it is obvious that the future has in store many more momentous questions which the whole gas industry will have to face in combination through the Council; and there must be no stinting of any necessary expenditure. Otherwise, we shall live to rue the short-sightedness. On March 31 last, there were 841 undertakings subscribing to the funds of the Council, representing 88 p.ct. of the total make of gas in the United Kingdom. Where are the undertakings comprised in the 12 p.ct.? Are they not enjoying the fruits of the work done voluntarily, and the expenses attaching to which are paid by the 841 undertakings? Surveying modern and prospective conditions, there is certainty that the fullest unity is essential. The very position and progress of the industry attract people—some to see what they can get out of it, others moved by envious motives, others again who seek to put before it new barriers and upon it new obligations. There is no question the National Gas Council will have to be maintained in existence and in the highest state of efficiency and power—always. To part with it (no one fortunately dreams of doing so) would be to cut out from the industry a vital part.

"Field's Analysis."

On a later page will be found a review of the 1924 edition of "Field's Analysis," which has just been published. Attention is drawn to some of the notable figures contained in the work; particularly interesting being the reference to the working of the Gas Light and Coke Company for the past year. The "Analysis," under the guiding hand of its compiler, Mr. H. E. Ibbs, Chief Accountant of the Gas Light and Coke Company, will be found to maintain fully the high standard of efficiency which is always associated with this publication.

Mains of Insufficient Capacity.

At length, a clause has been agreed between the railway companies and the National Gas Council to supersede the one which previously had existence with regard to relief to gas undertakings from the obligation to supply gas where mains are of insufficient capacity. In future, gas undertakings should be able to obtain the insertion of this clause in their Private Bills or Special Orders. The negotiations over the clause have given much trouble and absorbed much time; but the issue appears to give full protection to gas undertakings who may require it, while satisfying the railway companies, which has not been an easy matter. The clause appears *in extenso* in our "Parliamentary Intelligence" under the heading of "Mansfield Corporation Bill."

All-Electric Houses.

We should like the attention of the Rochdale Town Council called to the article which appeared in the "JOURNAL" for May 13 (p. 444) under the heading "Municipal Prohibition of Gas." They will see in it that Parliament does not approve of municipal authorities removing from tenants of houses their right to use whichever forms of lighting, heating, and cooking they prefer. It appears that the Gas and Electricity Committee of the Rochdale Council have decided to adopt a new policy in Corporation houses. According to the "Rochdale Observer," they have hitherto provided a dual service of gas and electricity. Now in sixty-six new dwellings on what is known as the Kilworth Street site, they have decided that electric fittings only shall be installed. The houses will have coal-heated ovens; but the choice is to be between these and electric stoves. We hope the Council will have a greater consideration for domestic economy and the liberties of the tenants than the Committee have shown by their autocratic resolution. Also that they will consider the bearing of the Newport decision to which reference is made in the opening lines of this paragraph.

Domestic Coal Prices.

Through untoward circumstances, the price of gas has ascended; but fortunately this is the period of lightest consumption. The London coal merchants are now making strong efforts to secure the custom of householders. In Central London the "lowest summer coal prices" came into operation last Saturday. From the quotations we see that Derby brights show a reduction of 3s. 6d. per ton on 1924, and 1s. on 1923, whereas kitchen nuts are no less than 6s. cheaper than in 1924, and 5s. cheaper than in 1923. "Best coal" is now quoted at 50s., as against 56s.; best silkstone, 44s. 6d., against 48s.; Derby brights, 45s., against 48s. 6d.; and so on until we come to kitchen nuts at 36s., against 42s.; and stove coal 32s., against 38s. 6d.

How to Save Money.

At their conference at Brighton last week, the Royal Institute of Public Health had the question of the uneconomy of coal smoke brought before them in a paper by Dr. Charles S. Thomson, the Medical Officer of Health for Deptford. He asserts that of the 100 million tons of coal used in this country for industrial purposes, 43 millions are wasted—a record which he is certain must bring a smile to the faces of the very efficient Germans. If manufacturers would only take steps to provide heat without wasting so much by the crude use of coal, they would not need to tremble over their contributions under the new insurance scheme. That is the view of Dr. Thomson.

Electrical Humour.—During the recent heavy floods at Batley the following letter was received at the Gas Office from an electrical engineer: "DEAR SIR,—Will you kindly let some one attend to the gas supply at the above address? It seems to be adopting an electrical tendency—being of an alternating nature, with a periodicity of about 1 per sec."

DIPLOMA WINNERS.

In the Institution Gas Engineering Examination.

We have received from the Organizing Secretary of the Education Scheme of the Institution of Gas Engineers (Mr. Walter Hole) a list of the successful candidates at the recent examination for the Institution Diploma in Gas Engineering. The certificates will be presented by the President (Mr. J. Ferguson Bell, M.Inst.C.E.) at the first session of the annual meeting.

First Class.

Name.	Address.	Subject of Thesis.
PRATER, THOMAS HAROLD	London . .	Coal Gas Condensation.

Second Class.

SMITH, SYDNEY	Birkenhead .	The Manufacture of Sulphate of Ammonia.
BLAKE, THOMAS VINCENT	Cardiff . . .	The Volatile Products of Coal with Continuous Vertical Retorts.
MELVIN, DUNCAN DEWAR	Glasgow . .	The St. Mungo Washer-Scrubber.
DYSON, THOMAS . . .	Longwood . .	The Construction and Working of the Dempster-Toogood System of Vertical Retorts.
BATEMAN, CHARLES . .	Cardiff . . .	The Neutralization of Sulphate of Ammonia.

There were no candidates for the Diploma in Gas Supply this year.

The results in the Ordinary and Higher Grades will be published in due course not only of the Engineering and Supply Examinations, but of those in the ancillary subjects.

PERSONAL.

Mr. A. H. BESCHE, who for many years was Sales Director of Messrs. Kerr Stewart & Co., Ltd., of London and Stoke-on-Trent, has been appointed General Sales Manager of Messrs. J & F. Howard, Ltd., of Bedford.

Mr. S. BARKER JOHNSON, the Engineer and Manager of the Colombo (Ceylon) Gas and Water Company, Ltd., has arrived in England on furlough. He travelled from Ceylon on the "Ormuz," and reached London on May 29. The London Offices of the Company are at No. 148, Gresham House, Old Broad Street, E.C.

The Colne (Lancs.) Town Council have adopted a recommendation of the Gas Committee that an honorarium of £100 be granted to Mr. H. THORPE, the Gas Engineer, in respect of special professional services rendered by him in connection with the installation of new plant and the re-modelling of the gas-works. The Chairman of the Gas Committee (Alderman Keighley), replying to an amendment, said Mr. Thorpe had been doing a lot of special work during the last five years. He had got them out of a difficulty, and by adopting his advice the Council had saved between £30,000 and £40,000. Only six voted for the amendment.

OBITUARY.

We are sorry to learn of the death at Bristol, on the 21st ult., of Mr. ROBERT A. BROWNING. He underwent an operation early last month, which was satisfactory; but unhappily complications subsequently set in. Mr. Browning resigned in 1915 from the position of Engineer and Manager at the Neath Gas-Works, after having been in the service of the Corporation for 34 years, and was appointed Consulting Engineer for a period of three years. He will be greatly missed from the meetings of the Wales and Monmouthshire District Institution of Gas Engineers and Managers, whose second President he was. The Institution was formed in the autumn of 1905; and Mr. Browning followed the late Alderman Thomas Canning, of Newport, in the chair in 1906—the Institution holding a meeting at Neath during his year of office.

Industrial Gas Salesmen's Circle.

The next meeting of the Circle will be held at the Council House, Birmingham, on Friday, June 19. Members will assemble at ten o'clock. During the morning inspection will be made of the industrial gas demonstration rooms and research laboratories of the Birmingham Gas Department, and visits will be paid to the Windsor Street heat treatment shops, and to the works of the Moss Gear Company, Ltd. At one o'clock a luncheon will be held in the Imperial Hotel. During the afternoon brief statements, accompanied by drawings or diagrams, on the following subjects will be presented for discussion: "Some Uses of Gas in Printing Works;" "The Application of Gas to Ship Repairing;" "Large Pipe Bending;" and "Gas and Other Fuels for Power Purposes."

ELECTRICITY SUPPLY MEMORANDA

WE are not sure whether the "Electrical Review" intends to be humorous or whether it is a little off the path of truth, when noticing a new scheme for enlarging the finances of the Electrical Development Association. If what it says is true, then the inference is that a large part of the administrators of the electricity supply industry are very foolish and apathetic. It states that men in the various branches of the industry are so imbued with the "electrical idea" that they cannot conceive that the backwardness of the people is anything more than sheer apathy. In the same vein, it proceeds: "They think that, if electricity cannot sell itself on its merits alone, there is nothing more to be done. Accordingly, they go on advertising their individual products merely hoping to attract the attention of those who are already converted to electrical methods, while suppliers of electricity wait for the would-be consumer to call at the office for a list of charges." It is admitted that "there are many honourable exceptions, but they must be exceptions, or Great Britain would be using as much electricity per head as (say) the United States." Is it true that that is the unbusinesslike way electricity trading is carried on? We cannot believe that advertisers of electrical wares merely hope to attract the attention of those who are already converted to electrical methods; their idea in advertising is to attract those who are not already converted, and to keep prominently before purchasers the virtues of their own particular productions. Nor are we inclined to think that electricity suppliers sit in their office armchairs waiting for the would-be consumer to turn up, and ask for a list of the charges. If that is a correct representation of the position, then it is time that the laggard administrators were sent about their business, and enterprising business men appointed in their stead. It also suggests another thing, that the Electrical Development Association have not succeeded in rousing these inert maladministrators to see the errors of their sleepy ways, or have not by their work impressed upon a large proportion of managements the indispensability of the organization, and the effectiveness of its work. Instead of asking for money to educate the public, they should first request a goodly fund for the purpose of educating managements to better business methods, and then the future of the Association would be assured and fully provided for. Of course, it is a far cry for this country to realize a consumption of electricity per head equal to that of the United States. Conditions here and there are not wholly similar; and there are sufficient reasons for the difference which now exists.

Sleepy Administrators.

Then our dear friend the "Review" indulges in a little illogical musing. First of all it says that electricity will not sell itself any more than any other commodities which are not positively essential—and this despite those electrical men who rave about the super-merits of the electrical way of doing things, which is not endorsed by the major preference of the public being for gas, with its greater value for money expended. It asserts with truth that "it is futile to say that electricity is essential to the individual." But this is followed by the vain boasting which is inseparable from the electrical mind, and which has done some amount of good among the people by causing them to look with suspicion upon those who claim everything good for their commodity and acknowledge no defects, which have become as well known to the public as the meretricious prating regarding merit. Says the "Review," "that electricity will ultimately supersede every other form of energy, we are convinced; and we therefore conceive it to be the duty of all who desire the advancement of the race to hasten that consummation." That is wonderful. The mere statement of a personal conviction is not proof that the predicted will happen. The grounds of the conviction are more important, and knowledge of them would be more interesting than the mere unsupported conviction of the "Electrical Review." When the great gas industry is put to death—a prospect which we contemplate with marvellous equanimity—by the appropriation by electricity of the whole of its business, "electricity will," remarks our sagacious contemporary, "then be really essential, for its competitors will have fallen out of use." That is perfectly obvious. If there is only one means of providing light, heat, and power, then that means would be "essential." Perhaps our contemporary can give us some intimation as to the distance of time covered by the term "ultimately," because we see no present or prospective signs of gas falling out of use. As a matter of fact, its position is being strengthened daily. It is neither good logic nor is it practical to talk as the "Review" does in this connection. If gas as a competitor is to be superseded, then as a preliminary electricity has to realize treble or quadruple its present efficiency in the utilization of coal. In this relation, we should like our contemporary to tell us what is to happen to the carbonization of coal, which is "fundamental in the part it plays in modern

On Being Essential.

civilization" and in the work of the world; the products being highly essential to our industries. Being so, gas must be produced; and as gas is produced with a greater efficiency than electricity, more potential heat energy is, for a given sum, placed at the disposal of the individual through it than through electricity. If the latter is only to become "really essential" by the death of its competitors, then it will have to wait a very long time.

More Propaganda Revenue Wanted.

If what our contemporary says is the sort of thing that is considered to be necessary to construct a case for a larger revenue for the Electrical Development Association, we are afraid it will not assist much among intelligent men. However, we get to a more serious plea for support of the work of the Association. What is wanted, it is stated, is education of the public. "The public," it is said, "is not apathetic when it is shown where its best interests lie; and it is the work of the electricity industry to do this." What has the Development Association been doing during the years of existence if it has not been educating the public? If the organization has been performing its functions efficiently, it has been "educating" the public from the electrical point of view; but apparently the public are not convinced that their "best interests lie" in the adoption of electricity for cooking and room and water heating. We admire the sagacity of the public. Our contemporary, however, thinks that "within the rigid limits imposed by inadequate funds, the E.D.A. has accomplished a great deal; but none of its effective slogans is yet a household word." We are not astonished. Now the Association assert that the industry is not giving it enough money to make the work as effective as it should be. The result is spasmodic efforts instead of a sustained campaign. Therefore a brochure has been prepared which has been addressed to the members of committees, boards, and managers of all electricity supply undertakings in Great Britain. In this the activities of the Association are described; and care is taken to show how small a proportion of the revenue of electricity supply undertakings is devoted to the important work of educational propaganda. The request is made to the responsible persons addressed to arrange that 0·1 p.ct. of the revenue of their undertakings is contributed to the funds of the Association. It is stated that the manufacturers and other associations have agreed to increase their subscriptions if the suppliers will respond to the appeal. It is confidently anticipated that the proposals for future activities will result in assuring the Association a revenue sufficient for their growing internal work, and in addition for direct educational efforts, to the value of from £20,000 to £25,000 per annum.

The Enlarged Campaign.

The main objectives of the enlarged campaign which the Association hope to be able to carry out if entrusted with greater disbursement power are described as follows: To build up national and industrial goodwill; to remove unwarranted bias and criticism; to establish and maintain public confidence; to encourage local inquiries for electrical information and advice; to create demand; to obtain increased revenue from the fixed charges of electricity supply undertakings; to reduce the cost of supply to consumers; and to increase the revenue and profits of suppliers. Regarding this programme our contemporary remarks: "Nothing is said of the direct benefits to manufacturers and contractors; but these are, of course, sufficiently obvious. Such a programme should loosen the purse strings of the most sceptical or conservative committee or board."

A Queer Reply.

Viâ the Editors of the "Electrical Review" (whom we thank for their courtesy), we have had forwarded a letter from Mr. E. G. Ross, which purports to be a reply to our criticism (see "Memoranda" for May 20) of an article of his which appeared in our contemporary. Of all the disjointed, ineffective effusions that has ever reached us from any source, this one, we truly believe, easily takes precedence. There is not a point in it which in any way alters our criticism and expressions of opinion based on experience and testing (scientific and practical) which were published upon his laboured and fruitless work—fruitless because the analyzed heat losses on gas and electric hotplates (the data being derived in his case by methods which were confessedly crude, and therefore unreliable) are easily ascertained in the total by doing the same amount of water boiling, noting the input of thermal energy while the work is being done, and discontinuing when the water reaches boiling-point. There is for making comparison more definiteness and reliability in this procedure than in that of Mr. Ross. Several of the comments of our correspondent are really too absurd to deal with seriously. But reference may be made to three or four points. Mr. Ross makes a distinct departure from the truth when he says: "I am indebted for the suggestion that *it is essential* to keep on full heat for four hours to keep the pot contents boiling." Nowhere in our criticism did such a stupid idea as that appear; nowhere did we say that such a thing was "essential." As to the loss of heat when boiling, he says that a "minimum" of 30 p.ct. is not contradicted by us. We would ask Mr. Ross to read again what he said in his article: "From data variously collected, it would seem that when boiling for approximately four hours in a pot about 5½ in. diameter, anything from a minimum of 30 p.ct. to a maximum of 60 p.ct. of the available gas heat is lost, due to these essential conditions of burning." This is what we said: "The minimum of 30 p.ct. is nearer *normal* practice to-day than the maximum of 60 p.ct. As a matter of fact, the modern boiling-ring on the hotplate of a gas cooker is quite capable of developing 70 p.ct. efficiency." Cannot he see in this that we did not agree with his minimum *per se*, but accepted it as being about "normal." There is a wide difference between a minimum of 30 and a maximum of 60 p.ct. It is observed that Mr. Ross carefully abstains from replying to our inquiry as to whether he can suggest to us any electric boiling-plate which will at any part of its life and continuously give an efficiency of 70 p.ct.; and he ignores the question: Is it not the fact that most electric hotplates will only develop (when new) 40 to 45 p.ct. efficiency, and that a diminishing quantity with use?

Ribs and Costs.

As to the old-fashioned ribs which assist to dissipate heat by conduction from the hotplate of gas-cookers, we mentioned that the gas industry found this out long ago. Mr. Ross asks then why were the ribs not cleared out "long ago;" and further he wishes to know just what proportion of all the cookers installed in this country do the "modern cookers" made within the last few years represent. On Mr. Ross's notepaper, we see his description is "Electrical and Mechanical Engineer." As such we should have imagined he would know that it is no light task to take out a few million gas-cookers and reconstruct the hotplates. We have to be sensible in dealing with such matters. What is being done by many gas undertakings is, as cookers come in for renovation and repair, to remove the old hotplates and incorporate one of the high efficiency types. This, an engineer will agree, is a rational proceeding. Goodness knows how many "modern" cookers have been installed in this country the last few years; but the makers have been busy turning them out, and not for the mere fun of the thing. They have also been making the new types of efficiency hotplates for replacement purposes; and a good business it is. Mr. Ross gives his expenses for gas cooking (including boiler) over a period of eight months as £5 16s.; and electricity (light and iron), flat rate, as £3 8s.—together £9 4s. We do not know what the respective charges were, or the amount of work done. But in a corresponding electric-cooker period, the total costs on the two-part tariff (including 13s. 4d. hire charge, and 7s. 10d. for gas for boiler) was £7 7s. 11d. No information is given as to the fixed charge and the charge per unit, nor as to the work done. All that is said is "for the same conditions of living." As they stand, the figures do not prove anything." In connection with them, we will repeat the last five lines of our previous comment: "After all this, will Mr. Ross accept a challenge to do an equal amount of work with an electric cooker (oven and hotplate) as with a gas cooker, at a cost for 'fuel' of ¾d. per unit for electricity and 10d. per therm for gas, or 3420 B.Th.U. as against 7500 B.Th.U. for ¾d. in each case?" He has omitted to reply to this. We will guarantee adequate publicity for the results of the test.

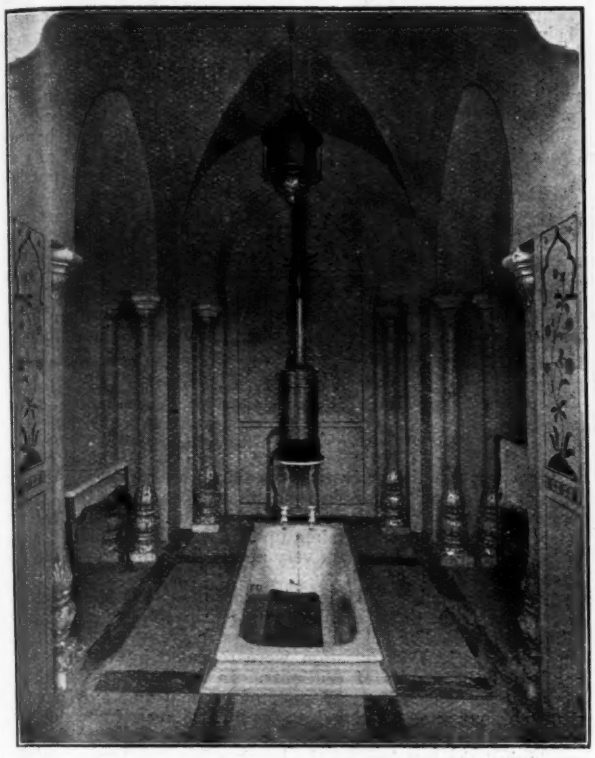
"Safety" of Electricity.

In the "Memoranda" last week, reference was made to a fire which occurred at the Royal Sussex County Hospital at Brighton, and which again illustrated the danger of installing electric wires in close proximity to gas-pipes. In that case the fusing of an electric wire melted the gas-pipe, and ignition followed. Since then, there has been a fire at Doncaster at a piano shop and warehouse in Hall Gate, which was also due to the fusing of two electric wires. The heat from the fused wires melted a gas-pipe, and precisely the same thing happened. The gas escaped, was ignited, and the floor boards caught fire. These illustrations should be a warning to those who wire houses in which gas-pipes are already located. Recently James Hannon received a fatal shock while working at the Orgreave Colliery Coke-Ovens, near Sheffield. It seems that the man leaned over a handrail in order to loosen some coke; and in doing this he caught, with a hooked iron bar he was handling, an overhead trolley wire at 275 volts. The ground he was standing on was very conductive, being composed of damp coke breeze. A verdict of "Accidental death" was returned. We also see that three men were severely burned at the Hull Corporation Electricity Station last Saturday week. Additions were being made to a 6000-volt switchboard gear, when there was a severe short circuit, which had the effect of temporarily disconnecting the main turbines. There was an explosion, and a tremendous flash of flame. In addition to injuring the men to such an extent that two of them had to be detained in hospital, the supply of electricity was temporarily cut-off from one district.

"The Conversion of Coals into Oils."—This book, by Dr. Franz Fischer, has been translated by Dr. R. Lessing, and is now published by Messrs. Ernest Benn, Ltd., at 36s. net.

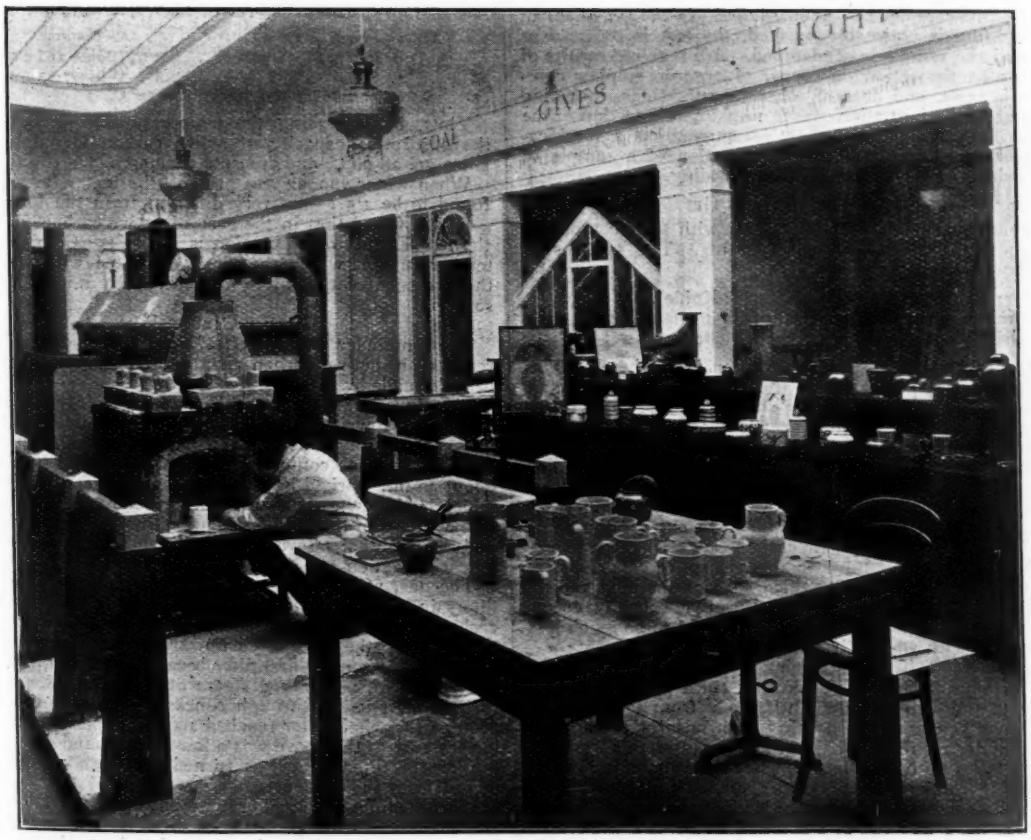
THE GAS EXHIBIT.

SUPPLEMENTARY VIEWS.



The Bathroom, with Gas Water-Heater
Supplying both bath and hand basin with hot water, in the "Indian" Section of the Gas Exhibit.

Ice-Making and Refrigerating Plant in the "Indian" Section of the Gas Exhibit.
This is operated without machinery. Heating only over a gas-ring results in the production of small blocks of ice convenient for use in drinks as well as for cold storage purposes.



POTTERY-MAKING BY THE DISABLED EX-SERVICE MEN EMPLOYED BY THE ASHTEAD POTTERY
The pottery is baked in the gas-fired oven to be seen on the left.

BENZOLE RESEARCH.

Second Report of the Joint Benzole Research Committee.

The Second Report of the Benzole Research Committee of the National Benzole Association and the University of Leeds deals in detail with the corrosion test for benzole and other motor spirits, with laboratory experiments on various kinds of active carbon and silica gel, and with visits to working plants where benzole is being recovered by the new method of adsorption.

The account of the research work of Mr. W. H. Hoffert bears ample evidence to indicate that he is a worthy successor to Prof. E. C. Williams as Research Chemist to the Committee.

Sulphur in Benzole.—Certain benzole motor spirits, though free from sulphuretted hydrogen and containing not more than the 0·4 p.ct. of sulphur allowed by the National Benzole Association specification, having been proved to have a marked corrosive action on copper, were subjected to careful examination. Such benzoles cause trouble in motor engines by attacking copper and brass parts such as floats, gauzes, feed tubes, &c., forming black deposits which flake-off and lead to choking of gauzes and jets and to vexatious renewals of corroded parts. The corrosive deposit was found to consist of cuprous and cupric sulphides. It was discovered that certain benzoles of a corrosive nature contained appreciable quantities of free sulphur; and this led to an investigation of the action on copper of solutions of sulphur in benzole of known source and purity. It is interesting to note that—as was established by these investigations—the presence of certain impurities in the benzole tends to inhibit or prevent corrosion of the copper, and that the concentration of free sulphur required to cause corrosion depends on the nature and amount of such impurities. In carrying out these tests, preliminary treatment of the copper surface was found to have a marked influence on the corrosive effect; the most sensitive surface being obtained by mechanical polishing, rather than by chemical cleaning.

After an examination of the published methods of determining free sulphur in benzole, a modification of the method of Ormandy and Craven was adopted. Briefly, the modified test consists in removing the sulphur from the benzole as mercuric sulphide by shaking with mercury, then treating the sulphide with concentrated hydrochloric acid and absorbing the sulphuretted hydrogen thus evolved in an ammoniacal solution of cadmium acetate. Excess of iodine is added, and the back titre obtained with thiosulphate.

Consideration is given in the report to the "doctor" test commonly used in America for the detection of objectionable sulphur compounds in petroleum fractions. This consists in shaking the sample with sodium plumbite solution and free sulphur. If the sample is discoloured, or if the yellow colour of the sulphur film is noticeably masked, the test is reported as positive, and the sample is condemned. After giving results of experiments on the action on copper of organic sulphur compounds in benzole, and data of other investigations, including explanations of the formation of free sulphur, this section of the report concludes without definitely recommending a specification test for determining the corrosive action of a sample of benzole, seeing that the work is still proceeding.

Active Carbon v. Silica Gel.

The second section of the report deals with tests comparing active carbon and silica gel as adsorbents. The samples of active carbon examined were:

1. German active carbon (Bayer T Kohle).
2. American coconut charcoal of high retentivity.
3. Urbain active carbon or coal ("charbon actif").

The respective quantities of benzole taken up by these carbons and by silica gel when saturated at 20° C. with a benzole-air mixture containing 0·86 p.ct. by volume of benzole vapour (the amount ordinarily present in coal gas) were as follows, expressed as percentage weights of adsorbent: Urbain carbon, 36; coconut charcoal, 32; Bayer T carbon, 28; and silica gel, 18. In spite of these differences, the efficiencies of adsorption were practically the same in each case—about 98 p.ct.; twice as much gel, by weight, being required to extract the same amount of benzole as with Urbain carbon.

The influence of temperature on the adsorptive capacities, at saturation, of the T carbon and silica gel was the next subject for investigation. The decrease in adsorptive capacity occurring with a given rise in temperature was found to be much less than is the case with wash oils.

Experiments carried out on the influence of aqueous vapour on the adsorption of benzole proved that silica gel adsorbs the water vapour and removes it quantitatively from the air mixture, but nevertheless shows a fairly high adsorptive capacity for benzole under recovery conditions. It may seem surprising that the gel takes up benzole at all, since the vapour is present at considerably lower partial pressure than the aqueous vapour. That the gel at first takes up more benzole than water arises from the fact that, though the volume of water vapour present in the gas mixture is two to three times that of the benzole vapour, a given volume of benzole vapour yields 4·33 times as much liquid by weight as an equal volume of water vapour. The benzole thus fills up the pore space before sufficient water reaches the gel.

Active carbon, on the other hand, preferentially adsorbs the benzole, and the presence of water vapour does not affect the efficiency up to the break-point. The adsorptive capacity at the break-point and at saturation is, however, slightly reduced; the respective percentage weights for a sample of active carbon being 20·3 and 22·5, instead of 26·0 and 28·0 in the absence of water vapour.

In comparing Bayer T carbon, which has low retentivity, with coconut charcoal, which has high retentivity, no appreciable difference in efficiency of adsorption was observed. The difficulty experienced in removing the adsorbed benzole from the latter is regarded as significant from the point of view of steam consumption on the commercial scale, and possible "poisoning" of the carbon by high-boiling substances.

It was concluded from the results obtained by Hoffert, and those already given in the first report, that for a gas containing 0·86 p.ct. by volume of benzole vapour (2½ gallons per 12,000 c.ft.) and saturated with water vapour at 18° C.—that is, under conditions corresponding approximately with those of large-scale practice—the maximum quantities of benzole taken up at saturation by active carbon and silica gel would be as follows:

	Grammes Benzole Adsorbed per 100 Grammes Adsorbent.	Grammes Benzole Adsorbed per 100 c.c. of Adsorbent Space (material, 5—8 mesh).
Active carbon . . .	15 to 30 ..	5·8 to 11·6
Silica gel.	8 to 14 ..	5·7 to 10·0

Thus, though the active carbon shows a considerably higher adsorptive capacity for benzole than does silica gel under benzole-recovery conditions as calculated on the *weight* of the adsorbent, the quantities taken up by these adsorbents as calculated for a given *volume* are very nearly the same, owing to the greater density of the gel.

As Urbain had stated that his experiments on silica gel did not agree with those of Williams (First Report, 1924), and Chaney found silica gel to be valueless in presence of moisture, the investigations in question were repeated by Hoffert, who confirmed the results of Williams. In Hoffert's test, with an air mixture containing 0·88 p.ct. of benzole and 2·05 p.ct. of water by volume, silica gel took up 11·6 p.ct. by weight of benzole and 6·2 p.ct. by weight of water at the break-point. On continuing the test beyond the break-point, the benzole left in the gel after 2000 minutes dropped to 0·4 p.ct. by weight.

The effects of variation of temperature on the recovery of benzole from a benzole dry-air mixture by active carbon, silica gel, and creosote are compared in an interesting way; the results being as follows:

Percentage Reduction in Quantity of Benzole taken up at 15° C. caused by Increase in Temperature.

Active Carbon.	Silica Gel.	Creosote.
1·2*t* ..	1·38*t* ..	2·74 (Bunte and Frei)
		3·7 (Rhead)

where *t* = number of degrees above 15° C.

Thus, by increasing the temperature from 15° to 35° C., the adsorptive capacity of active carbon is reduced 24 p.ct., silica gel 28 p.ct., and creosote over 55 p.ct.

When water vapour was present, the factor for silica gel was found to be 1·5 *t*—not very different from the foregoing.

It was found that in the case of active carbon, provided that the temperature of adsorption is 10° to 15° C. higher than the temperature at which the air is saturated with water vapour, the presence of the latter has practically no influence on adsorption.

Active Carbon Plants.

The remainder of the book of 246 pages is devoted mainly to reports on active carbon plants, and on the quality of the benzole made by these.

The Bayer plant at Leverküsen, near Cologne, was working on purified town gas, and was dealing with up to 70,000 c.ft. of gas per 24 hours, obtained from Ruhr coal of poor quality. Two filters, each containing 5½ cwt. of T carbon to a depth of about 40 in., worked in series, and were preceded by a prefilter which held 2 cwt. of cheap B carbon for removing naphthalene. The contents of the prefilter required renewal every eight weeks, and the naphthalene was driven-off, and the carbon reactivated, by carbonization at 600° to 900° C.

The gas, after leaving the prefilter, passed through the two filters in series, and travelled downwards through the active carbon layer, as it was found that the "pulsing" which occurred when the gas flowed upwards caused powdering of the material. When the first filter became saturated, it was cut out of the system, and closed steam at about 70 lbs. pressure was turned on, passing through concentric coils in the filter. As soon as the whole filter reached 100° C., open steam of a similar pressure to the above was allowed to expand directly into the top of the filter, and was turned off when no more benzole flowed from the condenser.

After steaming, the filter was put into operation again at once; the debenzolized gas from the filter still in operation being used to cool and dry the steamed carbon—the cooling of the latter being rapid, owing to loss of heat by evaporation of the water remaining in the carbon. In this way each filter was

successively saturated, steamed-out, and put on in series after the other, which had meanwhile been working alone. The steam consumption was said to be about 3 lbs. per lb. of benzole recovered; but a trial run gave a higher figure.

When the plant was inspected, the active carbon in the filters had been in use for six months, during which time 3 to 4 tons of benzole had been obtained. There was no evidence that the adsorptive power of the carbon had decreased appreciably during that time. The benzole recovered was light yellow in colour, contained 0·5 to 0·9 p.ct. of sulphur (chiefly as carbon bisulphide), and distilled 95 p.ct. to 140° C. There was apparently no specification in Germany for benzole used as motor spirit, and the benzole was used as recovered in motor cars, and on a 45 H.P. "Mercedes" test bench motor, in which no trouble had so far been experienced.

A plant on similar lines to the above had been erected at Hüls, near Recklinghausen, for the extraction of benzole from unpurified coke-oven gas, but had not been put into operation, owing to political and economic difficulties in the Ruhr. Arrangements had been made for the gas from a battery of 60 Otto coke ovens to be sent either to the scrubbers for the removal of benzole by oil-washing, or to the newly-erected plant for recovery of both sulphur and benzole by means of active carbon. The scheme is as follows: The gas, 3½ million c.ft. per day, first passes through the filters for sulphur recovery, and then through the benzole filters. In the former sufficient oxygen (1 p.ct.) is added to the gas to promote the reaction $2\,H_2S + O_2 = 2\,H_2O + 2\,S + 111$ calories, which takes place in the presence of active carbon. A little ammonia is added to act as catalyst. A special form of active carbon (F carbon) is made from lignite by the Bayer Company for this process, and the reaction proceeds at the ordinary temperature. Three sulphur filters are installed. At any time one filter can be used for the removal of sulphuretted hydrogen, a second filter can be extracted with a solvent to remove the sulphur from the active carbon, and the third can be steamed-out, and dried by the gas coming from the first filter. The solvent preferred is ammonium sulphide, and each filter in turn is filled with a solution of this chemical, as it is found that mere percolation through the carbon does not dissolve the sulphur. If removal of the sulphur is found to be incomplete, arrangements are made for a final wash with monochlorbenzene. The ammonium polysulphide obtained is decomposed by steam, with precipitation of sulphur, which is filtered and centrifuged; and the ammonium sulphide is used over and over again. The benzole filters are substantially of the same design as those at Leverküsen.

A benzole plant working with active charcoal on purified gas at Bernau Gas-Works, Germany, is also described. This had been in operation for three months at the time of the visit. A naphthalene prefilter was not used; and superheated steam at 280° C. was employed for stripping the benzole. The latter was only faintly coloured, contained 0·5 p.ct. of sulphur, and distilled 90 to 95 p.ct. up to 120° C. It was claimed that it worked perfectly as a motor fuel, and caused no formation of carbon or gum in the engine. About 3·4 lbs. of steam per lb. of benzole were necessary for stripping the benzolized carbon; but to this figure must be added an allowance for superheating. No loss of efficiency of the carbon had so far been observed.

The Bayer Company are credited with making the following different kinds of active carbon:

1. H, ordinary. Made from wood. Sp. gr. 0·25.
2. T. Made from peat. Sp. gr. 0·4. Improved form for benzole, &c.
3. B. Cheap form for naphthalene and "tar-fog." Sp. gr. 0·6 to 0·7.
4. F. Made from lignite. Sp. gr. 0·3. For removal of sulphuretted hydrogen.
5. E. Decolorizing carbon. Screenings from the other types.

The Grenoble plant, in which Urbain active carbon was being used, was inspected, and is described in the report. Dr. Urbain claimed to have produced a carbon superior to the Bayer product; and at the plant installed at the Grenoble Gas-Works three filters were in operation at the time of the visit—two filled with Bayer T carbon (880 lbs. in each), and one with Urbain carbon (770 lbs.). The filters worked in parallel, and there was no prefilter for naphthalene removal. The gas treated was purified in the usual way with oxide; and a volume of about 300,000 c.ft. per day was being debenzolized. In normal operation two filters were adsorbing in parallel while the third was being steamed. Each filter operated on a 12-hour cycle; the adsorption period being 8 hours. They had been in commission for 2½ months (about a year ago).

The method of removing the adsorbed benzole was by first heating the carbon to 100° C. by means of an internal steam coil for 30 to 40 minutes with steam at 70 lbs., and then passing superheated steam at 7 lbs. and 250° C. directly into the top of the filter for half-an-hour. After driving-off the benzole, the filter was dried by heating the carbon by means of the internal steam coil while gas was passing through. The average steam consumption was 2½ to 3 lbs. per lb. of benzole; but a ratio of 2 to 1 was claimed under optimum conditions. At the maximum gas speed for which the filters were designed (175 c.ft. per minute per filter) the loss in gas pressure was 1½ to 1¾ in. of water; and in this respect at any rate the Urbain filter was distinctly better than those filled with Bayer carbon. The records of the plant appeared to substantiate the claims that the Urbain carbon was also slightly superior to the Bayer product in rate of adsorption and in capacity, as well as in resistance to disintegration.

The quality of the benzole obtained was very good. It was practically water-white, and the evidence would seem to indicate that benzole of better appearance is obtained when superheated steam is used instead of saturated steam for stripping the carbon. The sulphur content was 0·57 p.ct. by weight; more than half of this being in the form of carbon bisulphide. Distillation of the benzole yielded 94 p.ct. at 125° C.; and a copper dish test gave only a small quantity (0·017 gramme per 100 c.c.) of brown resin.

As regards the possible use as motor spirit in this country of unrefined benzole recovered direct from coal gas by means of active carbon, some doubt is expressed as to whether such motor spirit would be acceptable, or would pass the present specification tests. So far, on the Continent, only limited supplies of carbon-recovered motor benzoles have been available, and these have been used as soon as recovered, before any appreciable polymerization of the gum or resin forming constituents could be expected to take place.

The book concludes with a very full bibliography (21 pages), for 1923 and 1924, of literature relevant to the production and purification of benzole.

As we know that active carbons and silica gels (see "Petroleum Times," April 18, 1925, p. 728) are being improved rapidly, there must be plenty of work before the Benzole Research Committee; and we look forward with great interest to the publication of further valuable investigations.

EVENING STAR LODGE, No. 1719.

On Wednesday evening last the regular meeting of the Evening Star Lodge, which is always held on the fourth Wednesday of the month of May, took place. W. Bro. Hermann L. Sheppard was in the W.M. chair; that of the S.W. being occupied by Bro. A. H. Henry, and that of the J.W. by Bro. Frederick G. Cockey.

First, W. Bro. E. G. Smithard, of King's Lynn, P.M., P.P.G. Treas., Norfolk, was installed as Treasurer of the Lodge for the year 1925-26, he having been prevented from attending the last meeting, when the appointment and installation of the other officers was carried out.

Three candidates for initiation were then ballotted for; and the W.M. declared each of them unanimously elected. They were: Mr. Wilfred Baker Claridge, Manager, Engineer, and Secretary of the Marlborough Gas Company, Wilts; Mr. James Waldron Swan, Assistant Manager and Secretary of the Hitchin Gas Company, Herts; and Mr. Leslie Walter Dunn, Engineer-in-Charge at the Linacre Works of the Liverpool Gas Company, Bootle, on new constructional work.

The initiation of Mr. Claridge was then carried through by the W.M., W. Bro. Valon, P.M., L.R., assisting; the office of J.D. being discharged by W. Bro. James Foreman, and that of S.D. by W. Bro. A. L. Croager.

Reference was made to the Emergency Meeting of the Lodge, which is to take place in the Grand Temple of Freemasons' Hall on Monday, June 8, when about two hundred masonic members of the Institution of Gas Engineers are expected as guests, on the eve of the opening of the Institution's Annual Meeting.

The Lodge having been closed, the members and visiting brethren dined together in the Connaught Rooms—W. Bro. Sheppard presiding as W.M. After the Loyal Toasts, the health of the W.M. was pledged at the call of W. Bro. Rae P. Normand, I.P.M., and W. Bro. Sheppard, after expressing his acknowledgments, proposed "The Immediate Past Master," who responded. To the toast of "The Initiate," submitted by the W.M., Bro. Claridge suitably replied; and W. Bro. Jacques Abady, P.M., L.R., gave that of "The Visitors," which was responded to by Bro. William Claridge, of the Harpenden Lodge No. 4314 (father of the initiate), Bro. B. L. Thomas, of the Centre Lodge, No. 3701, and Bro. H. F. Mainwaring, of the Sir Francis Drake Lodge, No. 4375. "The Past Masters and Officers of the Lodge," given from the chair, was acknowledged by W. Bro. E. G. Smithard, P.M., on behalf of the former, and by W. Bro. A. L. Croager, on behalf of the latter.

An excellent musical programme was provided.

Visitors at the Institution Meeting.

At the annual meeting of the Institution of Gas Engineers, which opens at the Institution of Civil Engineers on Tuesday, June 9, a number of distinguished visitors and members from overseas are expected. They will be welcomed at the commencement of the proceedings by the President, Mr. J. Ferguson Bell, M.Inst.C.E., of Derby. The Rt. Hon. J. H. Thomas, M.P, the Rt. Hon. Sir Alfred Mond, M.P., and Mr. Woolley (Chairman of the Derby Gaslight and Coke Company) will respond on behalf of the former, and the Hon. George Swinburne, of Melbourne, will speak for the latter.

FORTHCOMING ENGAGEMENTS.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

June 5.—Southern Association of Gas Engineers.—Visit to the works of the Bournemouth Gas and Water Company.

June 6.—Scottish Junior Gas Association (Eastern District).—Annual outing at Anstruther.

June 6.—Yorkshire Junior Gas Association.—Visit to the works of the Wakefield Gaslight Company.

June 6.—Society of Engineers.—Visit to Welwyn Garden City. A short descriptive lecture on the aims of the Garden City will be given by Sir Theodore Chambers, K.B.E.

June 8.—Institution of Gas Engineers.—Council meeting at No. 28, Grosvenor Gardens, at 2.15.

June 8.—Evening Star Lodge.—Regular meeting, at 5 p.m., in the Grand Temple of the Freemason's Hall, Great Queen Street, London.

June 9-11.—Institution of Gas Engineers.—Annual general meeting in the Great Hall of the Institution of Civil Engineers, Great George Street, Westminster. At the termination of Thursday's meeting, a Council meeting will be held at the Institution of Civil Engineers.

June 10.—Association of Statutory Inspectors of Gas Meters.—Annual general meeting at the new County Hall, Westminster. The afternoon will be devoted to a visit to the Finsbury gas meter testing office.

June 11.—Coke Oven Managers' Association (Midland Section).—Visit to the Barugh plant of Low-Temperature Carbonisation, Ltd.

June 12.—Institution of Gas Engineers.—Visit to Derby. Members should note that the luncheon will be in the Drill Hall, Derby—*not* the Assembly Rooms, as indicated in the programme.

June 19.—Industrial Gas Salesmen's Circle.—Meeting at the Council House, Birmingham. Inspection will be made of the industrial gas demonstration rooms and research laboratories of the Birmingham Gas Department, and visits will be paid to the Windsor Street heat treatment shops, and to the works of the Moss Gear Company, Ltd.

June 20.—London and Southern District Junior Gas Association.—Visit to the Cambridge Gas-Works.

June 30.—Last Day for Coke Competition Papers.

July 9.—Coke Oven Managers' Association (Midland Section).—Visit to the works of Messrs. Stainby and Lyon, of Knottingley.

July 20-25.—Royal Sanitary Institute.—Congress at Edinburgh. H.R.H. the Duke of York has accepted the Hon. Presidentship of this Congress, at which Sir John Gilmour, Bart., Secretary for Scotland, will preside, and deliver the Inaugural Address. A health exhibition is to be held in connection with the Congress.

SCOTTISH JUNIOR GAS ASSOCIATION.
(EASTERN DISTRICT.)

Visit to Leslie and Markinch.

The Association paid a visit to the gas-works at Leslie and Markinch on Saturday, May 16. There was a good attendance of members; the party including Mr. David Vass (Perth), and Mr. J. J. Scott (Cowdenbeath), honorary members.

Mr. Henry Gourlay, Manager of the Markinch Gas-Works, met the visitors at Markinch Railway Station, and the party proceeded to the Leslie Gas-Works. On arrival, they were received by Mr. John Letham, Manager of the Leslie Gas Company, Ltd.; and Mr. Anderson extended a hearty welcome on behalf of the Directors. A tour of inspection was made. A feature of the plant was a new setting of horizontals erected by Messrs. R. & G. Hislop, of Paisley.

The visitors then proceeded to the Markinch Gas-Works, where they were welcomed by Mr. Allan, Secretary of the Markinch Gas Company, Ltd. He expressed the hope that their present visit would be as enjoyable as the last, in 1921. Mr. Gourlay conducted the party over the works, and explained the various improvements and extensions which are to be carried out. An inspection of the gas engines at the power house of the adjacent water works completed a very interesting afternoon.

Following the inspection, the visitors were conveyed to the Town Hall, and hospitably entertained at tea by the Leslie and Markinch Gas Companies.

Mr. Alan Clark (Perth), Vice-President, in the absence of Mr. Laing (Brechin), the President, expressed the thanks of the members for the enjoyable and interesting afternoon they had spent.

Mr. Anderson replied on behalf of the two Companies. He remarked on the benefits which accrued from membership of the Scottish Junior and kindred Gas Associations, both to members themselves and to the undertakings they served. The intercourse between members engaged at different works, and the present-day facilities afforded for inspecting other works and plant, were of valuable assistance. In his opinion, a wider application of the same principle to other industries would greatly improve industrial conditions generally.

Mr. David Vass (Perth) added a few words in appreciation of the visit and the courtesy with which they had been welcomed.

The concluding item on the syllabus of the Association for this session is the annual outing, which will be held at Anstruther on Saturday, June 6. An inspection of the Anstruther Gas-Works, and also an oilskin factory, will take place in the forenoon. After luncheon, at the kind invitation of the Anstruther and Cellardyke Gas Company, Ltd., golfing and bowling competitions will be held; the visit concluding with tea in the Gas Company's showrooms. On this occasion, lady friends of members are cordially included in the invitation.

FORMS OF PYRITES IN COAL.

At a recent meeting of the Manchester Geological and Mining Society, Mr. J. Lomax read a paper, entitled "Further Researches on the Various Types of Pyrites in Coal, Especially in Relation to Spontaneous Combustion," based upon work done in the laboratories of the Lancashire and Cheshire Coal Research Association. From this the following extracts have been made.

Crystalline Pyrites is often found in strong coals, but is seldom noticed, on account of being enclosed in a pocket-like lenticel. Some lenticels are quite small; others comparatively large. When broken, they are found to contain well-formed and beautiful crystals. Under normal conditions these are usually non-oxidizable, and therefore harmless from the point of view of spontaneous combustion.

Massive Pyrites consists of irregular blocks, which frequently occur as lenticels, usually embedded in a matrix of soft coal. The coal matrix is very friable, and on exposure quickly becomes detached, leaving the pyrites free. Originally these blocks were pieces of wood of varying sizes; the vegetative cell structure could still be detected. This type is often found in coal seams, especially in the Lower Coal Measures. The conclusion with regard to the massive banded pyrites is that though on the surface they are apparently harmless, they rapidly oxidize under favourable conditions, and must therefore be classed among the dangerous types.

Nodular Pyrites occurs as round, oval-shaped nodules in all grades of coal, but is most frequent in the soft inferior coal of the vitrain or clarain varieties. Often such coal is traversed by vertical joints, some filled with pyrites. Between the vitrain and the pyrites there is a thin layer of fusain. Such layers cause splitting of the coal in the immediate area. A large block of moderately hard coal, in which a layer of this soft coal occurred, was cut-out to separate it from the surrounding mass. After five days' exposure in a dry room the coal surrounding the pyrites was broken-up by a large number of radial cracks, and the more fragile material in contact with the pyrites fell into dust and slack. When this type of pyrites occurs in quantities, under favouring conditions, it is undoubtedly a source of spontaneous combustion.

Stringy Pyrites occurs in most coal seams; the strings or veins running parallel with the bedding planes of the coal. A specimen obtained from the Deep Mine of the Wimblebury Colliery Company at Hednesford was of an unusual character; the strings or veins occurred at right angles to the bedding planes of the coal. The structure of the coal substance was similar to that of many other coal seams. It was composed of bands of soft coal easily fractured. The constituents were chiefly the remains of vitrainized wood, broken-down leaf laminæ, thin layers of microspores, occasional megaspores, resinous bodies, and small lenticels of fusain. It was a difficult matter to estimate whether this type was a source of danger, as the strings were usually found in a fully pyritized condition; but it was very seldom that oxidation took place. It may, therefore, be regarded as harmless under normal conditions.

Globulites.—In many coal seams there frequently occur bands and lenticels composed of myriads of small shot-like bodies. To this form of pyrites the term "globulites" was applied. Usually a brown substance forms the inner portion, and pyrites forms the outer shell or crust. Occasionally, they are composed of pyrites only. These bodies have undoubtedly been derived from vegetative tissues. Globulites occur in all classes of coal as isolated bodies or aggregations forming bands of varying thickness. They are not regular, although they may extend over considerable areas. If partially pyritized, which is usually the condition in which they are found in the softer classes of coal, oxidation as a rule is very rapid, and the coal is quickly reduced to fine slack.

"FIELD'S ANALYSIS" FOR 1924.*

THE new edition of "Field's Analysis" dealing with the figures for the year 1924 has just come to hand, and, as usual, is found to provide many interesting facts for the consideration of all and sundry connected with the gas industry.

There is nothing special to remark upon in the make-up of this year's publication, which is issued in the form to which we are now becoming accustomed, and which still retains (as we think it should) working results based upon per 1000 c.ft. of gas sold as well as per therm. There may be some, but surely very few, in the industry who would be prepared to say that the per 1000 c.ft. basis could, in this work, be done away with altogether, even in the event of the whole of the undertakings coming under the Gas Regulation Act.

In reviewing the figures presented to us in the past, it has been our custom to confine attention to groups rather than to individual undertakings; but on this occasion it is proposed to depart from this practice, as there is an exceptional fact to record. We make no apology for so doing, as it has reference to the largest, and therefore the most important undertaking in the country—viz., the Gas Light and Coke Company. On turning to p. 6 of the "Analysis," we find under "Net Coal and Working Expenses" a column which represents the total cost of working without taking into consideration capital charges of any kind; and this shows that the Gas Light and Coke Company accomplished the feat for the first time within memory of beating not only their immediate neighbours but also all the Suburban Companies included in the Analysis. Comparisons, of course, are odious; but the Gas Light and Coke Company have so often stood the brunt of adverse criticism in the past—merited or otherwise—that no one will object if the limelight is now turned in other directions in order that this Company may receive whatever praise is due to them. For this purpose there can be no better comparison than that provided by the South Metropolitan Company, who have always been regarded as a model Company. In their case the total cost is 7·686d. per therm, as against 7·509d. for the Gas Light and Coke Company. The main items comprising these figures are as follows:

	Gas Light. Per Therm. Pence.		S. Met. Per Therm. Pence.
Net coal	1·658	..	1·636
Manufacture—			
Salaries and wages	0·562	..	0·756
Purification	0·057	..	0·166
Wear and tear	1·740	..	1·542
Distribution	2·081	..	2·266
Rates and taxes	0·678	..	0·340
Management	0·366	..	0·515
Co-partnership	0·094	..	0·178
Other charges	0·273	..	0·287
	7·509	..	7·686

From this statement it will be seen that the disadvantage of having a larger rateable value (in consequence presumably of the greater gross profit that has to be made by the Gas Light and Coke Company), bringing in its train an excessive charge for rates, is overcome by less expenditure in other directions. Wear and tear of works plant is higher; and it is interesting to refer to the expenditure under this head during the last four years—*i.e.*, since the introduction of the Gas Regulation Act. The figures extracted are as follows.

	Gas Light. Per Therm. Pence.		S. Met. Per Therm. Pence.
1921	2·707	..	1·774
1922	2·573	..	1·723
1923	2·271	..	1·618
1924	1·740	..	1·542

The question immediately arises as to the effect of this greater expenditure upon the price of gas. Here, however, we find that the policy has not had a detrimental effect, as, notwithstanding this larger expenditure, the price of gas charged by the Gas Light and Coke Company, as shown by the "Net Gas Rental," is only increased by 50 p.ct. over pre-war days—viz., from 5·37d. per therm in 1913 to 8·11d. in 1924—a moderate percentage when compared with most other commodities. One of the reasons for this is, of course, the fact that the post-war capital charge is very little greater than that experienced in pre-war days—a fact which is all to the advantage of the consumers.

This matter, in its bearing upon the charge which the consumers might reasonably be called upon to pay, can be viewed in another way—viz., by taking the position of the Gas Light and Coke Company in pre-war days relatively with the South Metropolitan Company. The "Net Gas Rental" charges in 1913 for these Companies were as follows.

Gas Light	5·369d.
South Metropolitan	4·415d.

If the percentage of difference that existed then is applied to the South Metropolitan prices from 1921, we obtain the following figures:

	Net Gas Rental—Per Therm. Pence.
1921	12·623
1922	12·374
1923	9·907
1924	9·187

Whereas the actual figures for the Gas Light and Coke Company were:

	Per Therm. Pence.
1921	13·117
1922	11·205
1923	8·861
1924	8·110

On this basis there is a total reduction over the period of no less than 2·798d., which would have been further enlarged to 5·432d. had it not been for the increased expenditure of 2·634d. on "Wear and Tear, Manufactory."

Translating the charge of 5·432d. per therm into its cash equivalent, we arrive at a sum of over £3,000,000, of which it may be said the consumers have received one-half, the balance having been spent on further improvements in the works of the Company, in order that the benefit of still cheaper gas may be in store for them—a fact which would appear to be already indicated by the success achieved during 1924.

That inferences such as these can be arrived at by reference to present and past editions of the "Analysis" illustrates in a marked degree the value of the material furnished by the work; and it would almost appear to make it imperative that the familiar red covers should lie within easy reach of every gas manager or official concerned in administrative work in the industry.

With regard to the other figures to be found in the "Analysis," attention should be drawn to the continuance of the splendid progress that has been such a marked feature throughout the industry generally during the last few years. The year under review was, in fact, a culminating one, since only one undertaking out of the 35 dealt with experienced a decrease—viz., Widnes—who were unfortunately down, but only to the very small extent of ¼ p.ct. The average increase for the whole of the undertakings included in the Analysis was no less than 6¼ p.ct.—a result which was contributed to by a satisfactory increase in the number of consumers of 3·3 p.ct., and a still more satisfactory increase in the number of stoves let out on hire of no less than 7·42 p.ct. The Richmond Company disappear from the Analysis, as they have been absorbed by Brentford; but the vacancy is taken by the North Middlesex Company, whose advent into the charmed circle is heralded by a winning figure in the vitally important matter of output—an increase of no less than 14½ p.ct. having to be recorded. In the London area—presumably on the same day—every Company but one reached its maximum output, some very fine figures being recorded. Among the Provincial Companies it is noticed that in two cases—viz., Newcastle and Sheffield—the figures are increased as against the corresponding figures of a year ago by reason of amalgamations with other smaller concerns.

As was to be expected, many deficits are shown in the case of the undertakings which ended their year on Dec. 31 last, in consequence, of course, of the slump that began to show itself in the market for secondary products towards the latter part of last year. In the case of the Corporations, where the year ends at an earlier stage, there is only one deficit—viz., that of Edinburgh.

The effect of the decline in the secondary products market can be gauged from the following figures, which show in the first place the cost of coal per therm for the two years 1923 and 1924, and, secondly, the cost of "Net Coal" over the same period:

Cost of Coal per Therm Sold.

	Gas Light. d.	Comml. d.	S. Met. d.	Met. Cos. d.	Subn. Cos. d.	Provl. Cos. d.	Dublin Co. d.	Provl. Corpns. d.	Scottish Corpns d.
1923	4·919	5·685	4·999	4·995	5·991	4·842	6·245	4·926	4·410
1924	4·875	5·906	4·986	4·975	5·832	4·978	6·659	4·583	4·724

"Net Coal" per Therm Sold.

1923	1·465	1·366	1·292	1·405	2·647	1·767	1·663	1·971	1·393
1924	1·658	1·848	1·636	1·663	2·859	1·994	1·378	1·243	1·182

It will be seen that, while the cost of coal has remained more or less stationary, the charge for "Net Coal" has progressed upwards in all cases with the exception of the Dublin Company and the Corporations; the reason for this latter exception being found in the fact mentioned above—that the year for the Corporations is completed at an earlier stage.

It is impossible to give an adequate review of a work of this kind, in which every figure, every line, and every column tells a tale. There is almost inexhaustible interest in the work, and upon it we heartily congratulate the Editor, Mr. H. E. Ibbs, and all who have assisted him in any way in securing and preparing the data, which, in large part, record the continued and material advance of the gas industry in the service of the community.

* "Field's Analysis of the Accounts of the Principal Gas Undertakings in England, Scotland, and Ireland," for 1924. London: Eden Fisher & Co., Ltd. Price £2 2s. Orders may also be sent to the "JOURNAL" Office.

NATIONAL GAS COUNCIL OF GREAT BRITAIN AND IRELAND.

SEVENTH ANNUAL GENERAL MEETING.

THERE was a very large attendance of members at the seventh annual general meeting of the National Gas Council, which was held on Tuesday afternoon of last week, at the Hotel Great Central, Marylebone Road, London, N.W.; and an innovation was the presence of members of the General Press. Mr. D. MILNE WATSON, D.L., occupied the chair at the meeting, and also at a luncheon which followed.

At the opening of the proceedings the minutes of the sixth annual general meeting, having been circulated, were taken as read, confirmed, and signed.

MEMBERS OF THE CENTRAL EXECUTIVE BOARD REPRESENTING DISTRICT EXECUTIVE BOARDS AND ASSOCIATED BODIES.

The SECRETARY (Mr. W. J. Smith) reported the following list of members of the Central Executive Board appointed and nominated respectively by the District Executive Boards and Associated Bodies:

Eastern District.—Messrs. T. Glover, C.B.E., M.Inst.C.E., Norwich; W. H. Mainwaring, Lincoln; R. G. Shadbolt, Grantham; and W. W. Townsend, Colchester.

Irish District.—Messrs. R. Bruce Anderson, A.M.Inst.C.E., Waterford, &c.; W. J. Grey, A.C.A., Dublin; Joseph McNicholl, Cork; and J. D. Smith, J.P., M.Inst.C.E., Belfast.

London District.—Messrs. F. J. Bradfield, F.C.I.S., Commercial; Archibald Caddick, Croydon; Thomas Hardie, M.Inst.C.E., Gas Light and Coke; and Frank H. Jones, M.Inst.C.E., Wandsworth, &c.

Manchester District.—Messrs. G. S. Frith, Runcorn; Fred. A. Pye, Chester; W. J. Smith, B.Sc., Bolton; and S. Tagg, M.Inst.C.E., J.P., Preston.

Midland District.—Messrs. Leslie E. Clift, Redditch; Harold Davies, Chesterfield; P. N. Langford, Coventry; and A. W. Smith, Birmingham.

Northern District.—Messrs. Norman S. Cox, Sunderland; Herbert Lees, A.M.Inst.C.E., Hexham; Thos. P. Ridley, F.C.I.S., Newcastle-on-Tyne; and F. P. Tarratt, Newcastle-on-Tyne.

Scottish District.—Messrs. Lawrence Hislop, Cowdenbeath; J. W. Napier, Alloa; Bailie R. G. Slorach, B.L., Hamilton; and Councillor James Stewart, Edinburgh.

Southern District.—Messrs. C. F. Botley, M.Inst.C.E., Hastings; Wm. Cash, F.C.A., Bournemouth; H. C. Head, M.Inst.C.E., M.I.Mech.E., Winchester; and A. Valon, M.Inst.C.E., Westgate and Birchington.

South Wales District.—Messrs. W. Clark Jackson, A.M.I.Mech.E., Neath; W. H. Johns, M.I.Mech.E., Swansea; and J. E. Kenshole, Merthyr Tydfil.

South-Western District.—Messrs. J. H. Ellis, Plymouth; S. E. Halliwell, Bristol; S. J. Ingram, Truro; and W. N. Westlake, Exeter.

Yorkshire (W.R.) District.—Messrs. Harold E. Bloor, B.Sc., B.Eng., York; E. H. Hudson, Normanton; Arnold E. Mottram, Ossett; and C. Wood, O.B.E., F.C.S., Bradford.

Institution of Gas Engineers.—Messrs. J. Ferguson Bell, M.Inst.C.E., Derby; C. F. Botley, M.Inst.C.E., Hastings; Samuel Tagg, M.Inst.C.E., J.P., Preston; and John Wilkinson, O.B.E., Nottingham.

British Commercial Gas Association.—Messrs. R. Halkett, Sheffield; Ald. J. H. Lloyd, M.A., J.P., Birmingham; Ald. F. S. Phillips, J.P., Salford; and D. Milne Watson, D.L., Gas Light and Coke Company.

Gas Companies' Protection Association.—Messrs. R. W. Edwards, Aldershot; D. H. Helps, M.Inst.C.E., Reading; and A. A. Johnston, Brentford.

THE REPORT.

The annual report, which was then submitted, will be found in last week's "JOURNAL," p. 586.

MR. MILNE WATSON'S ADDRESS.

The PRESIDENT, who was received with applause, said: It is now my duty to move: "That the annual report and audited statement of accounts for the twelve months ended March 31, 1925, as circulated, be approved and adopted." Before, however, proceeding to put that motion to the meeting, I have one or two things I should like to say to you with regard to past happenings and the present position of the gas industry.

Even a casual glance through the report will show that, as in previous years, the matters dealt with by the Council have been both numerous and varied. We have every reason to congratulate ourselves upon the results achieved and upon the progress made in assisting the gas industry to perform the important—I may say, indispensable—services which it renders to the community.

I do not propose to-day, however, to traverse the ground covered during the past twelve months, important though much of the work has been, but will confine my remarks to one or two subjects which are of outstanding interest and importance not only to the industry, but to the nation at large.

At the outset I would like to refer to an innovation which has been introduced this year. In past years it has been our custom on the occasion of our annual meetings to refrain from drawing public attention to the invaluable services which we, as an industry, are performing. To-day we have set aside our customary modesty, and have invited to join us members of the Press—to whom I feel sure you would like me to extend the most cordial welcome on your behalf—in order that they, at any rate, may be apprised of the national importance of our industry. Their presence here to-day is peculiarly opportune, as it will, I believe, ensure that we in the gas industry get fair play and a square deal in connection with any proposals put forward for artificially stimulating electricity supply.

SCIENTIFIC PROGRESS OF THE INDUSTRY.

The scientific progress made by the gas industry in recent years has been remarkable, and, as one would expect, this progress has been accompanied by a great expansion in the demand for gas. In 1902, the sales of gas in Great Britain amounted to no less than 160 thousand million feet. That figure had risen to 181 in 1907, to 205 in 1912, to 232 in 1917, to 265 in 1922, and this enormous output was yet larger in 1923, when it reached 274 thousand million feet. The figures for 1924 will doubtless show a still greater sale of gas, but even taking the sales for 1923, the increase over those of 1902 is more than 70 p.ct.—a record of which we are all very proud.

This remarkable achievement, which has been due in no small measure to the work undertaken by the British Commercial Gas Association in familiarizing the public with the innumerable ways in which gas can be made to meet the needs of both the industrial and domestic consumer, may to the layman seem phenomenal; but to those of us who are of necessity familiar with the fuel problems of the world, the outstanding position which the gas industry in this country occupies is not, perhaps, so surprising.

Let us examine this subject a little more closely. Nations succeed and localities prosper according as they are blessed with natural resources, and to the extent to which they can successfully adapt such resources, on economic principles, to the best needs of mankind. Natural wealth and natural resources predetermine the particular industry and trade upon which a nation or locality must rely for its prosperity, be it dairy-farming in Denmark, the timber trade in Scandinavia, or cotton-spinning in Lancashire. Conversely, a nation which endeavours to force—as it were in a hot-house—the growth of exotic trades and industries in its midst must ultimately fail in its object.

THE FUEL PROBLEM.

If this subject be investigated yet further, it will be found that the foregoing generalizations are equally applicable and true to-day in connection with the fuel problem existing in this and other countries.

I do not, of course, for one moment suggest that electricity does not fulfil most useful functions in its own special sphere in this country. Thanks to the skill and energy of those engaged in that industry, these functions are most admirably performed. Moreover, electrical apparatus made in this country is known for its excellence throughout the world, and I believe that those engaged in its manufacture, equally with those concerned in the supply of electricity, are second to none in scientific knowledge, resourcefulness, and initiative. I wish to make it clear that we in the gas industry in no way belittle the services of electricity—gas undertakings themselves employ electricity in their works—but I do most strongly emphasize the elementary axiom that this country's greatness has been due in the past, as it is due to-day, to its natural fuel resources. It was the discovery of coal-fields adjacent to iron deposits, and to the sea-board, which made these small islands the "factory of the world." This country has been blessed with fuel resources—other countries with natural water power. The absence of water power in these islands has proved no handicap, as water power is merely an alternative to coal, with which this country has been richly endowed. The broad result has been, as one would naturally expect, that, while in other countries where water power is available the development of electricity supply has been most marked, in this country, where coal is the prime asset, it is the gas industry which has been more successful in meeting the needs of the community.

The gas industry has, after an existence of over one hundred years, become the principal conservator of our invaluable coal supplies, converting them—as it does—into a purified fuel which is easy of transport, capable of storage, and readily adaptable to a thousand uses.

It is due to the fact that the gas industry has concentrated upon the natural resources available and upon their most

economic utilization that its position in this country has become unexcelled—if, indeed, it is equalled—in any other part of the world.

Any comparison between the gas and electricity industries in this and other countries whose natural resources are entirely different must, of necessity, be misleading. Great Britain, with its ample coal resources, must inevitably rely upon the development of the use of gas for fuel purposes, just as the absence of coal resources may compel Continental countries to employ electricity even for heating.

In this country, for both industrial and domestic heating, the use of gas is, by universal consent, admitted to be in all cases the most economical, and in many cases the only practicable, method. I am leaving out of consideration the question of lighting, whether it be by gas or by electricity, as no one can suggest that this is a material factor in the question we are now discussing. The one field in which it can be alleged to-day that electricity leads is power, and admittedly cheap power is very important for this country.

This brings us to this question: Is the cost of power supply in this country excessive? As the result of many inquiries, I find that this is far from being the case. On the North-East Coast electricity for power purposes is as cheap as in Chicago, and twice as cheap as in Switzerland, and in any case it only represents something like 1½ p.ct. of the total manufacturing costs.

In a representative engineering works, I have ascertained that power represents only 0·8 p.ct. of the total manufacturing costs. It is clearly not high power costs in this country which are the cause of trade depression. In fact, even if power were supplied for nothing, it is impossible to suggest that this could result in any appreciable improvement in the trade of the country.

The fact, however, that electricity is employed in this country on a smaller scale than in other countries more favourably placed for its development has suggested to Members of Parliament that this may be one of the major causes of the present industrial depression in this country. Is this so? It is true that Switzerland consumes 700 units of electricity per head of population as against 139 units per head in this country; but this in itself proves nothing. Can current be purchased there at much lower rates than here? Decidedly not.

The essential fact is, as the Parliamentary Secretary to the Ministry of Transport stated in the House of Commons last week, that Switzerland "pays twice as much for its current as we in the North-East of England do." How can it be said then that Switzerland has the advantage?

If electrical enthusiasts were right in their premises, one would expect to find on the North-East Coast infinitely less unemployment than obtains in Switzerland. Is this the case? Most decidedly not! In fact, I do not think I am exaggerating when I say that trade depression and the number of unemployed on the North-East Coast are as great if not greater than obtain on the Continent. Cheap electricity does not spell good employment. Power costs in industry are but a small (and in many cases an almost negligible) factor. This point cannot be over-emphasized; and if it had not been overlooked, I do not believe that Parliament would be following this will-o'-the-wisp to-day. But let us pursue our comparison with the Continent still further. If small consumption of electricity per head of population were a cause of unemployment, it would necessarily follow that other countries with a consumption comparable with our own would be similarly burdened with the problem of the unemployed. Do facts support this theory? Far from it. Both France and Germany consume very little more electricity per head than we do in Great Britain, and yet, as we are all well aware, unemployment in those two countries is practically non-existent. If study is given to the question, it is clear that the consumption of electricity in this country has but little, if any, relation to the volume of unemployment. Sir Robert Horne himself frankly admitted last week that he had been one of those who had talked in "very round enthusiastic language" on the subject, and stated: "My study of this matter has convinced me that we have talked a little bit wildly of what can be immediately achieved by the development of electrical schemes." This view was confirmed by Colonel Moore Brabazon, the Parliamentary Secretary to the Ministry of Transport, who issued a timely warning against exaggeration in connection with "what electricity could do for the people." I am glad to think that at last, owing to our efforts, some idea of the truth is beginning to dawn upon them.

Happily we have a sane Government in office; and—as one would expect—during the debate on this question last Thursday, both the Minister of Transport and his Parliamentary Secretary refused to be hustled into giving a hasty verdict on so vital a question before they had time to study the whole subject.

THE ELECTRICITY PROPOSALS.

To gain a clear perspective, I must once again refresh your memories by referring to the only definite proposals which have hitherto been put forward—viz., those propounded by Mr. Snowden, the late Chancellor of the Exchequer, last year. He, you will recollect, proposed to grant subsidies out of the National Exchequer for the development of electricity in this country, first, in order to establish a uniform frequency, in which connection he mentioned a figure of ten million sterling; secondly, for the purpose of the laying of main transmission lines in cases where the undertakers had no intention in the near future of laying such lines with their own resources—in other words, where the laying of such lines would be an uneconomic proposition; thirdly, for the development of electricity in rural areas, including the electric lighting of cottages and the so-called general improvement of the amenities of country life.

It is interesting to note that Mr. Snowden admitted last week that his ultimate aim and object was to achieve the nationalization of the electricity supply industry. He stated:

> "My confidence is such that I would not hesitate even to spend public money in improving the undertakings which are still in the hands of private companies, knowing full well that the time will very quickly come when we shall buy out those private companies, and then what assistance they have received from the State will be taken into consideration in estimating the price."

I can hardly believe that a Conservative Government will take any steps which will pave the way for that ultimate nationalization which Mr. Snowden is so eagerly anticipating.

Reverting to the actual proposals which have been put forward, I must confess that I was surprised to find that visionaries are still to be found who regard the extension of electricity supply to rural districts as an economic and paying proposition, a proposition that will help the electricity industry to sell its commodity cheaply. So fantastic and fallacious are many of the statements in this connection, that it is difficult to know where to commence in refuting them. I do not think, however, I can do beter than quote from the speech made by the Chairman at this year's general meeting of the Yorkshire Electric Power Company:

"Much has been said lately as to the use of electricity for agricultural purposes. It is, to my thinking, a beautiful dream of enthusiasts who have given very little thought to the revenue the farmer is willing to pay, as he now gets the power he requires from a small oil engine run for a very few hours a day.

"The principal obstacle in the way is the cost of distribution. To make a connection to a high-pressure electric main involves an expenditure of at least £200, although the amount of power required may be very small. Practically, it is found inadvisable to provide such a connection for less than, say, 50 H.P. The average farmer requires from 10 to 15 H.P.

"We are supplying between twenty and thirty farmers, and our results show that our average expenditure is £300 for each supply, and that the annual use is very small.

"In other countries special attention has been given to the possibility of supplying farmers with electricity, but it is found—as we find in this country—that the small amount of supply which the farmer requires stands in the way of a general extension of use.

"In Sweden, for example, it is found that the use made by farmers does not exceed 20 units per acre per annum, and the difficulty of providing the supply at a price which would be attractive to the farmer is the same as in this country.

"In Denmark supply is offered to farmers at a central transforming or sub-station. From these centres the farmers jointly bear the cost of the distributing mains, but their method of construction of overhead lines is such as would not be permitted in this country, and the dróp in pressure in the long lines makes the lighting of little value when the main power supply is required.

"In France they are finding the same difficulty of a small use by the farmers. So much has been said about the use of electricity for agriculture that I thought these very few short facts would be rather interesting to the shareholders of the Company."

These are the words of the Chairman of an important electric power company, and most useful, in my judgment, for the whole country. I venture to commend them to the notice of Mr. Lloyd George, who has recently referred to what France and Denmark are doing with regard to electricity supply in rural areas. He even went so far as to give the views of an electrical expert, whom he quoted as saying that, in agriculture, electricity "would really double the produce." A careful search has failed to discover this statement, but in any event I do hope that Mr. Lloyd George and other Members of Parliament will not be carried away by these dreams and visions. It is extremely improbable that the farming community will avail themselves of electric current even when carried through rural areas, as they will find it is cheaper and more convenient to use an inexpensive and mobile internal combustion engine. To-day, those who farm on only a modest scale have their own motor tractors, and can—and do—utilize these on the farm for power purposes, such as grinding corn, chaff and root cutting.

So much for the blessings of electricity for those engaged in agriculture.

I now return to the other proposals—viz., the co-ordination of the type of supply, the interconnection of stations, and the laying of main transmission lines. These questions naturally hang together. It would be out of place at this meeting to discuss the technical aspects of the case, but I would like to refer to a statement recently made by the President of the Institution of Electrical Engineers, who pointed out that "the

carriage of coal from (say) South Wales to London, for the purpose of generating electricity at stations in London, is more economical than the establishment of generating stations in the coal-field and the transmission of electricity from the coal-field to the Metropolis."

Does it not therefore follow that the laying of great lengths of electric cable will increase, and not reduce, the cost of supplying electricity, and that money spent thereon will be money absolutely wasted, unless those cables are the means of providing a greatly increased demand, without which cheaper electricity is impossible?

You will have seen from the extract which I read to you that the electric power companies expect no assistance in this respect from the rural areas. I am therefore compelled to ask the all-important question—viz., Who is to find the money required to carry out this costly experiment?

If it is both sound and remunerative to adopt these proposals, why does not the electricity supply industry itself undertake the work? What ails electricity? Is the industry "depressed?" Far from it. Their financial resources are great. They have every facility for raising capital on highly favourable terms. If they have not the necessary legislative powers for joint working or amalgamation, Parliament can grant them; but the gas industry is entitled to—and does most emphatically—protest against any suggestion that State aid should be afforded to the electricity supply industry for "putting its own house in order." Any financial assistance from the Government, whether it takes the form of a guarantee or cheap money, or a direct grant, must of necessity react most seriously upon the gas industry, which to-day, in free and fair competition, can well hold its own against its rival.

In truth, the motive which underlies all these proposals is the desire to attain a high load factor in the *only* way in which it can ever be attained—and herein, to my mind, lies our greatest danger—by taking from us by means of State aid those domestic consumers we already serve. Electricity covets most of all the domestic load carried to-day by the gas industry. The Parliamentary Secretary to the Ministry of Transport himself, dealing last week with electricity, regretfully referred to the fact that "only 15 per cent. of the power generated in this country was used for domestic consumption." Be it always remembered that the domestic load is a fuel load—a load which in this country (as I have already indicated) is peculiarly and properly the province of the gas industry.

Again, what benefit would accrue to either the nation or the consumer if some State-aided scheme of electrical development were to enable electricity to be used in place of gas for fuel purposes? Benefit there would be none. On the contrary, the country would suffer irreparable loss. The employment of electricity for fuel purposes must always entail serious and unnecessary waste, and for this reason—that whereas 85 p.ct. of the total heat value of the coal is conserved when carbonized at the gas-works, the most efficient generating station utilizes only 20 p.ct., and wastes 80 p.ct. of the heat in the coal.

Such a policy would inevitably necessitate not only an enormous increase in the quantity of coal consumed, but—more serious still—the complete destruction of the numerous bye-products obtained from gas manufacture, indispensable alike in peace and war.

In conclusion, I contend that "robbing Peter to pay Paul" is not only inequitable, but is bad business, and I feel sure that no such policy would ever have been advocated in this country were it not for the fact that we are now passing through a period of unexampled trade depression. Statesmen are at their wits' end to devise schemes for remedying unemployment. Industrialists in many cases are disheartened and despondent. The community clutches at straws. At such a time it is more than ever essential that we should, every one of us, steady our nerves, maintain a true perspective, and, above all things, discourage panic legislation. I have no fear but that our industrial community will, if left to itself, achieve its own salvation in this respect. But I do most greatly dread and distrust any efforts of the Legislature to solve an industrial problem by Act of Parliament. [Applause.]

The Accounts.

Mr. WILLIAM CASH, F.C.A. (a Vice-Chairman of the Central Executive Board) said he rose to second the resolution which had been moved by the President At the same time, and in the first instance, he would like to bear testimony to the very valuable, interesting, and instructive address by the President to which they had just listened. ["Hear, hear."] He thought that such an address as that, delivered on such an occasion as the present one, must afford the greatest encouragement to them all, and prove of the utmost help to them individually in dealing with the situation as it existed to-day. Turning to the report itself, they would find in it a record of very good work done during the past year; and as far as the attached accounts were concerned, they were set-out in such a form that the members could see for themselves what the receipts and expenditure for the year had been. He would merely draw their attention to two items. First, on the receipts side, they would see, under revenue, that the net receipts for the year were £16,436; whereas for the year to March, 1924, the amount was £13,930. Thus they had every reason to feel encouraged on this head. As regarded the expenditure side, there was one new item—£1000 granted to the Institution of Gas Engineers. Under "British Empire Exhibition" this year was included the cost on account of erecting a Tar Exhibit. The result of the year's working was a surplus of £27.

The Municipal Point of View.

Councillor JAMES STEWART (Edinburgh) said that as a representative of a municipal undertaking, he had very great pleasure in associating himself with the remarks of the President and Mr. Cash. The gas industry, as they all knew, was one of the most important in the country, and was making progress against all competition. This was very largely due to the efforts of the National Gas Council, which since its inception had done a great deal to advance and popularize the use of gas. Without a Council such as that, each undertaking would have been "ploughing its own lonely furrow," without any great success. The report was very satisfactory, and showed good results, in which all the undertakings of the country equally shared. There was a good future for gas, and they knew that the efforts of the Council would greatly assist in its development. They fully recognized the benefits that were being derived from the efforts made by the Council to combat the proposals in regard to electricity.

The resolution was then put to the meeting and carried unanimously.

The President.

Sir ARTHUR DUCKHAM, K.C.B., said it was his pleasure to propose the re-election of Mr. Milne Watson as President of the National Gas Council. Mr. Milne Watson had remarked earlier that they were not politicians in that room; but he (the speaker) would beg to say that they had a statesman as their leader. The whole of the gas industry looked to Mr. Milne Watson as its leader—a very worthy leader, a man who had done colossal work on behalf of them all, and to whom they looked for further work, and even more important work, as the times became more difficult.

Mr. Milne Watson had referred to this as being the first meeting of the National Gas Council held with the general Press present. He agreed with him, that they in the gas industry had really not "gassed" publicly enough about themselves. In the war he (Sir Arthur) had nothing whatever to do with the gas industry; but incidentally he controlled the electrical industry of this country. Think what the gas industry did for the nation during the war (it had been put on record very finely by the late Lord Moulton); the basis of explosives came from the gas industry; extraordinary efforts were made by the industry to supply the needs of manufacturers in regard to heat and power—and yet at the end of the war not one suitable reward was given to anyone in the industry, and no acknowledgment was made by the Government in any way of the services that had been rendered by the industry.

Gas as a Domestic Servant.

Further, he did not think people altogether realized that gas was the greatest servant of the public to-day. Its services exceeded those of any other public utility business. The whole of the domestic life of this country had been changed by gas; the lot of the housewife had been made in all ways easier. The gas industry was for the prevention of the smoke nuisance; and the improvement that had resulted to the air of the towns since gas had become a domestic servant was noticeable by everybody. Now one could see right across London on a Sunday morning; whereas, had it not been for gas, the domestic coal range would have been cooking the Sunday dinner—and the atmosphere would have been heavy. Then there was the call for solid smokeless fuel; and in the future the gas industry must be the medium for meeting that. The bye-products from gas-works were also of vital national importance. He did not think that all this was fully realized by the public, who did not seem to appreciate that the gas industry was a magnificent and a growing one—enormously strong, very active, and keeping its house in order by research. Further, the public did not realize that the gas industry—outside municipal ownership—could not increase dividends unless the price of gas was reduced, and that probably it was the only public service that had its dividends dependent upon the price charged for its commodity.

The Electrical Position.

Mr. Milne Watson had dealt very fully and very ably with the electrical position; and he felt certain that his remarks would make a great impression on all who read them. It was to be hoped that they would find their way into the hands of members of Parliament and Cabinet Ministers who would have to deal with a subject which might land this country in a very great and possibly ill-considered expenditure. The gas industry wished to see a prosperous country, which would mean a prosperous gas industry; and as cheap electricity made for prosperity they could assure the electrical industry that it would have their support, and not criticism, in any scheme put forward to develop properly the electrical industry for the benefit of the country. But here was a scheme which, at this time of heavy taxation and national expenditure, envisaged a further large drain on the resources of the country to carry out something

which had not been proved. All that the gas industry asked was that due consideration should be given to any scheme, not only by the electrical enthusiasts—by those who had their bread and butter to earn by being connected with electricity—but by everyone who was concerned with the supply of energy. All the gas industry had to fear was hasty legislation—hasty action on the part of the Government. If the scheme was properly brought forward, and time given for constructive criticism, he was certain it could not go through in the form which, from various statements, one might surmise was now proposed. Look at the speeches that were delivered in the House of Commons—such as Mr. Lloyd George stating the other day that it was very much cheaper to transmit energy in the form of electricity over long transmission lines than to transport the coal, when it was an absolute and positive fact that it was not cheaper, except for short distances. Take another statement made by the Minister of Mines, that the only hope for the coal industry was low-temperature carbonization. When men who had spent their lives in the fuel industry saw statements like these, it naturally made them nervous, and anxious that prompt measures should be adopted to prevent hasty action being taken on such vital subjects.

CENTRAL CONTROL.

There was a final point in regard to this electricity scheme to which he would like to refer—namely, that, as far as one could see, it was entirely based on central control in London. He thought this would be the greatest piece of revolutionary socialistic legislation ever seriously proposed. Many of those present were in charge of works which produced energy; and he thought they would all shudder at the idea of their activities being controlled by a central board. This he considered would be the one thing that would damn the scheme as propounded for electricity generation in this country. It was a thing which would be unworkable, and which must lead to nationalization. He would keep them no longer. The meeting had started well; for he was certain they had all been tremendously impressed by the President's address. They would all return to their various parts of the country ready to fight for their industry, and for the good of the country as a whole. [Applause.]

THE BLIND LEADING THE BLIND.

Alderman F. S. PHILLIPS, J.P., of Salford (a Vice-Chairman of the Central Executive Board), said he esteemed it a very great pleasure to be allowed to second the proposal that Mr. Milne Watson be again elected President for the ensuing year. As a member of the National Gas Council, of the Federation of Gas Employers, and of the National Joint Industrial Council for the Gas Industry, he could not conceive that they could possibly have found a gentleman better fitted for the work. Mr. Milne Watson's patience, courtesy, time, and influence had been given to them unstintingly, and had secured what he regarded as the phenomenal success of the National Gas Council and the other organizations. It was gratifying to think he would serve them yet for another year, and it was to be hoped for further years to follow. Might he (the speaker), as an old municipal representative of some forty years' standing, refer to the question of electricity in a few words? He did not understand why the politicians had got hold of this question of electricity, and why they were pushing it for all they were worth, as though it were going to be a panacea for all the ills from which the country was suffering. It was an absolute mistake. It showed him, as he got older, that he must put less and less trust in politicians. [Laughter.] They did not seem to understand the things they were talking about; and this pushing of electricity at the present moment was simply a case of "the blind leading the blind."

CIVIC PRIDE.

A few days ago, Mr. Lloyd George, in a debate, referred to municipal authorities. Now, a long experience of municipal authorities enabled him (Alderman Phillips) to say there was such a thing as civic pride in the work they were doing; and he ventured to assert that the work of civic authorities did not stand second to the work of the House of Commons ["Hear, hear."], either now or in days gone by. The work of municipal authorities had been good, and it was still good; and it claimed the best thought of the best men in the district. But what did Mr. Lloyd George say of it? Mr. Lloyd George referred in this way to the vested interests of municipal authorities. Remember, these vested interests had been created by Parliament:

> "You can put a price upon every other vested interest—it is sometimes very heavy—but the price of human vanity is prohibitive; and if you have got a chairman and an engineer and a clerk, all engaged in the working of one sort of little business upon which they make reports every year, the reports appear in the Press, and it is their own particular child. Then when a Chancellor of the Exchequer and Minister of Transport propose to take their baby away from them, it is without price so far as they are concerned, and therefore they object very much."

What could Mr. Lloyd George be dreaming about? Municipal authorities and their powers were the creation of Parliament, of which Mr. Lloyd George was a member. He had taken his part in creating these powers. If they were earnestly administered, was it right to turn round and say that it was vanity? Of course, they objected to their "baby" being taken away from them. Did anybody mean to tell him (the speaker) that the men who were elected by the ratepayers of a particular district or town, and were administering affairs on behalf of the citizens, could not do it better than a central board which was unacquainted with these affairs? Was there any sense whatever in the suggestion? Vanity was one thing; proper civic pride was another, and a desirable, thing.

MILLIONS AT STAKE.

As he had said, he was surprised at the politicians pushing this electricity matter. He himself was a member of the Electricity Committee, by request of his Corporation, as well as Chairman of the Gas Committee. Electricity must have its functions. He did not object to this; but he did object if it was going to be subsidized to the detriment of gas. There was no reason in the proposal; it would turn out to be a delusion, and was going to cause a great waste of public money. The whole business led one to hope that politicians would keep to their own particular business—whatever that might be—and leave industry alone. What was going to be the upshot of it all? If they did by this means destroy the gas industry, created by Parliament, with its powers granted by Parliament, what would be the position? So far as municipalities were concerned—and he was speaking for the moment particularly of municipalities working on money borrowed under the powers granted them by Act of Parliament—with a capital of some £58,000,000 needing to be repaid, where would the towns be, if the gas industry were destroyed? He resented very strongly that statements such as one heard and read now about electricity should be made without sufficient information, and without adequate knowledge, and which would tend to create a worse state of things than now existed. It was not by such means that they were going to get away from bad trade and out of difficulty; it was by steady application, on business lines, to the problem, and not on these lines of fancy, which had no truth and no solidity behind them. He did not think the final form of generation of electricity had yet been reached; there were too many processes between the burning of the coal and the transmission of the current. Improved methods would come some day.

The resolution having been heartily carried,

The PRESIDENT said: Thank you very much. I really do think it is high time you had a change ["No, no."]; but if you are anxious to back the old horse, the old horse will do the best he can for another year.

OTHER OFFICERS.

Mr. J. FERGUSON BELL proposed the re-election of Alderman Sir William Kay, J.P., as Hon. Treasurer, and of Alderman H. Wade Deacon, C.B.E., J.P., and Alderman J. H. Lloyd, M.A., J.P., as Trustees. He said the Council were fortunate in having such gentlemen to guide their destinies. He was sure the members would like to send a message to Sir William Kay expressing their deep regret that for some little time past he should have been in ill-health, and the wish that he might have a speedy recovery. He had been a member of the Finance Committee, and had taken an active part in the work of the Council. Alderman Wade Deacon and Alderman Lloyd were very well known in the industry, and were strong supporters of the Council.

Mr. CHARLES WOOD (Bradford) seconded the motion, which was passed.

On the proposition of Mr. C. F. BOTLEY (Hastings), seconded by Alderman J. H. WADDINGTON (Mayor of Halifax), the re-election of the Joint Hon. Secretaries (Messrs. F. W. Goodenough and W. E. Price, Assoc.M.Inst.C.E.) and the Auditor (Mr. Alfred Morland, F.C.A.), was approved.

VOTES OF THANKS.

The PRESIDENT moved a hearty vote of thanks to the Chairmen and Secretaries of the District Executive Boards for their services during the past year. These Boards, he said, were essential to the efficient working of the Council. It was through them that it was possible to keep in touch with what was transpiring in the Provinces. It was very important that they should have the opinions of the districts. The positions of Chairman and Secretary involved a great deal of work; and a vote of thanks was a very small token of appreciation of their important functions.

Mr. FRANK H. JONES, seconding, said he realized that they had very efficient headquarters, and this efficiency must be very much enhanced by the work of the District Boards.

Mr. G. HARDY-HARRIS (Exeter) and Mr. SILLITOE (Manchester) acknowledged the vote—the former on behalf of the Chairmen, and the latter for the Secretaries.

The PRESIDENT next proposed a vote of thanks to the Finance Committee for their unremitting labours.

Mr. THOMAS GOULDEN seconded this, and it was acknowledged by Mr. CASH, who referred to the excellent work of the staff.

The PRESIDENT, proposing a vote of thanks to the staff (which

was cordially agreed to), said he thought none of the many organizations with which he was connected had a better staff than the National Gas Council. Mr. Fottrell, Mr. Ogilvie, Mr. Smith, and those who worked under them, were all first class, and were devoted to the Council's interests. They were blessed with discrimination and great intelligence; and all who came in contact with them would agree that they deserved this vote.

Alderman Sir ALBERT BALL, J.P., moved a vote of thanks to the President for his able address, and for the way in which he had conducted the proceedings at that meeting. They realized, he said, that in Mr. Milne Watson they had the first man in the industry to-day—one who was exceptionally tactful, full of determination, and always ready to do everything humanly possible for the gas industry. It was the sincere wish of every member of that Council that the President might be spared for many years to lead them, to give them the benefit of his advice and help; and with such service as this, he was satisfied that the gas industry would prosper for generations to come.

Mr. FERGUSON BELL seconded, with the remark that it required no words from him to commend this resolution to the hearty approval of the members. They were all aware of the great services of Mr. Milne Watson in respect of the Council. They were pleased to have him at their head; and they hoped to have him so for many years to come.

The PRESIDENT thanked the members, and added that it was a pleasure to preside over such an enthusiastic and determined gathering as they had had that day.

INSTITUTION OF GAS ENGINEERS.

Annual Report of the Council.

The following are the main portions of the report of the Council of the Institution of Gas Engineers for the year 1924-25, which will be submitted at the annual general meeting of the Institution, to be held in the Great Hall of the Institution of Civil Engineers, Great George Street, Westminster, S.W., on Tuesday, Wednesday, and Thursday, June 9, 10, and 11, under the Presidency of Mr. J. Ferguson Bell, M.Inst.C.E., Chief Engineer and General Manager to the Derby Gas Light and Coke Company.

Details of the programme for the meeting will be found on p. 59 of the "JOURNAL" dated April 1.

MEMBERSHIP.

Owing to the increasing number of applications for admission to the Institution, it was necessary to issue two balloting lists for the election of new members during the year.

The figures show that the net increase in membership was 55. The total number of members on the register at the end of that period was 1057. With the fifty candidates for election at the annual meeting, the total number on the register will be brought up to over 1100.

Class of Membership.	At Dec. 31, 1923.	Elected and Transferred in 1924.	Deceased, Resigned, and Transferred in 1924.	At Dec. 31, 1924.	Increase or Decrease.
Hon. members . .	24	..	3	21	− 3
Members	799	49	21	827	28
Associate members .	126	43	9	160	34
Associates. . . .	11	1	1	11	..
Students	42	14	18	38	− 4
Total . . .	1002	107	52	1057	55

The Council refer with gratification to the gracious consent of the Prince of Wales which enabled them to elect His Royal Highness an honorary life member of the Institution.

Since the last report was issued, the following have been transferred from the class of Associate Member to Member; and have been admitted as Students.

Transferred to the Class of Member.

Walter A. Barnett	Barnet.
Harry Curtis	Macclesfield.
Herbert C. Higgs	Basingstoke.
A. Graham Lane	Aylesbury.
David Muir	Pontypridd.
George W. Richmond.	Beckton.
George Walmsley	Londonderry.

Admitted as Students.

Edward Morgan Edwards	Neath.
Alexander S. Grime	Brentford.
Ralph Halkett, jun.	Sheffield.
Terence H. Madden	Cardiff.
Alan H. Nicholson	Stockton-on-Tees.
Wilfrid Richard Quiller	Plymouth.
John Roberts	Bingley.
Albert E. Simpson	Nottingham.
Alexander G. Skinner	Redhill.
Reginald F. Thomson	Nottingham.
Benjamin Thorpe	Longwood.
John H. Wainwright	Tipton.
John E. Wakeford	Stockton-on-Tees.

DECEASES.

The Council have to record, with regret, the deaths of the following members:

Sir George Beilby, F.R.S.	London.
Augustus F. Browne	London.
Charles C. Cawthra	Halifax.
Thomas Crossley	Guernsey.
P. B. Ellacott	Waterford.
Charles Franks	London.
Harry E. Jones	London.
John Lewis	Newcastle-on-Tyne.
Walter A. Sapey	Tamworth.
Stephen Temblett	Andover.
Thomas Watson	Rushden.
James Whimster	Armagh.

Of these, Sir George Beilby was an honorary member, and Mr. H. E. Jones a Past-President. Both of them rendered exceptional service in promoting the interests of the gas industry during a long life, particularly during the period of the war.

NATIONAL GAS COUNCIL.

The representatives of the Institution on the Central Executive Board of the National Gas Council during the year 1924-25 have been Messrs. J. Ferguson Bell, Charles F. Botley, Samuel Tagg, J.P., and Thomas Goulden.

AFFILIATED DISTRICT ASSOCIATIONS.

The seven affiliated District Associations have been represented on the Council of the Institution during the same period as follows:

Eastern Counties Association	Mr. Edward F. Keable.
Manchester District Institution. . . .	Mr. Harold Davies.
Midland Association	Mr. William E. Caton.
North British Association	Mr. James Campbell.
North of England Association	Mr. Samuel Shadbolt.
Southern Association	Mr. Leonard J. Langford
Wales and Monmouthshire Institution .	Mr. W. Clark Jackson.

ANNUAL GENERAL MEETING.

The sixty-first annual General Meeting was held in the house of the Institution of Electrical Engineers, Victoria Embankment, on Tuesday, Wednesday, and Thursday, June 24, 25, and 26, 1924, under the Presidency of Mr. Samuel Tagg, Engineer and Manager of the Preston Gas Company. Particulars are included in the report.

BRITISH ENGINEERING STANDARDS ASSOCIATION.

The representatives of the Institution on various Committees of the British Engineering Standards Association consist of Messrs. J. G. Clark, Thomas Hardie, Alex. A. Johnston, and Albert Stokes.

With reference to the Sub-Committee on the Standardization of Gas-Valve Flanges, on which Mr. Hardie represents the Institution, agreement has been reached by the Sub-Committee of the Association and the Joint Committee of the Institution and the Society of British Gas Industries. The following table gives the dimensions which have been approved by the Sub-Committee.

For Working Pressures up to 30 Lbs. per sq. in. for Gas and 50 Lbs. per sq. in. for Water.

Bore. In.	Diameter of Flange. In.	Diameter of Bolt Circle. In.	Bolts. No.	Bolts. Diameter. In.	Thickness. In.
2	6	4¾	4	⅝	⅝
2½	6½	5	4	⅝	⅝
3	7½	5⅞	4	⅝	11/16
3½	8	6½	4	⅝	¾
4	8½	7	4	⅝	¾
5	10	8½	4	⅝	¾
6	11	9½	4	⅝	13/16
7	12	10½	8	⅝	13/16
8	13½	11¾	8	⅝	⅞
9	14½	12¾	8	⅝	⅞
10	16	14	8	⅞	15/16
12	18	16	8	⅞	15/16
14	20¾	18¼	8	1	1
15	21¾	19¼	8	1	1
16	22¾	20¼	12	1	1 1/16
18	25¼	23	12	1	1 1/16
20	27¾	25¼	12	1	1⅛
21	29	26½	12	1	1⅛
22	30	27½	12	1	1 1/16
24	32½	29¾	12	1	1 1/16
26	33¾	30¾	16	1	1¼
27	34¾	31¾	16	1	1¼
28	35¾	32¾	20	1	1¼
30	37¾	34¾	20	1	1¼
32	39¾	37	20	1	1⅜
33	40¾	38	20	1	1⅜
36	43¾	41	24	1	1⅜
38	45¾	43	24	1	1⅜
40	47¾	45	24	1	1⅜
42	49¾	47	28	1	1⅜
45	52¾	50¼	28	1	1⅜
48	55¾	53¼	28	1	1⅜

The work of the respective Sub-Committees on Portable Photometers, Illumination Materials, and Fittings is being proceeded with, and will be reported upon when ready.

With reference to Sub-Committee 39/3, Standardization of the Methods of Testing and Specifying the Characteristics of Illumination Glassware and Translucent Materials of Sectional Illumination Committee 39/-, Mr. Stokes reports that satisfactory progress had been made by this Committee. A provisional draft of specification has been drawn up by the Sub-Committee dealing with the matters of quality, finish, dimensions, diffusing power, brightness, and efficiency of translucent glassware. Alternative methods of measurement—viz., the "flux" method and the "point-to-point" method—are recommended for adoption.

The following summary of the work carried out during the past year by the three Committees of the British Engineering Standards Association on which Mr. A. A. Johnston, of Brentford, represents the Institution, has been supplied by him:

(*a*) Sectional Committee on Machine Parts, their gauging and nomenclature.
(*b*) Sectional Committee on Pipe Threads.
(*c*) Sub-Committee on Steel Tubes.

With regard to Sectional Committee 10/- on Machine Parts, although no meetings were held during the past year a number of reports of its Sub-Committees were submitted to it by correspondence—namely: No. 164-1924, Limits and Fits for Engineering; No. 190-1924, Dimensions for B.S.W. Bright Hexagon Bolts, Set Screws and Nuts, Split Pins, Washers, and Studs; No. 191-1924, Dimensions for B.S.F. Bright Hexagon Bolts, Set-Screws and Nuts, Split Pins, Washers and Studs; No. 192-1924, Dimensions of Spanners.

No. 164 represents a satisfactory termination of a work which was full of difficulty, and should be of value in every department of mechanical engineering where interchangeability is required.

Nos. 190 and 191 should also prove a benefit to industry, as they represent the result of an agreement with the bright bolt manufacturers, by which the latter have undertaken to keep in stock the sizes shown in these reports.

Furthermore, the revision of the Tables on Black Bolts and Nuts is being undertaken, and a report on the lines of that for Bright Bolts and Nuts will, most probably, be submitted to the Sectional Committee in the near future; and the preparation of standards for cup-headed and countersunk black bolts for use in wagon construction, which has been asked for by the Railway Clearing House, will also be submitted.

No meetings were held by the Sectional Committee on Pipe Threads during the past year. Similarly in the case of the Sub-Committee on Steel Tubes, no progress has been made, owing to difficulties which have arisen in regard to the thicknesses and pressures coming under the designation gas, water, and steam.

International Commission on Illumination.

The sixth session of the International Commission on Illumination was held at Geneva from July 21 to 25, 1924. Mr. Robert Watson, of Doncaster, and Mr. Walter T. Dunn, Secretary of the Institution (owing to the unavoidable absence of Mr. W. J. A. Butterfield), attended as delegates; and their report will be presented at the annual meeting.

National Illumination Committee of Great Britain.

The Institution is represented on this Committee by Mr. W. J. A. Butterfield, Mr. J. G. Clark, Dr. H. G. Colman, Mr. F. W. Goodenough, and Mr. Robert Watson. The report of the Chairman (Col. Kenelm-Edgcumbe) for the year 1924 shows that important work is being carried out under the auspices of the Committee.

Wrought-Iron Tubing Committee.

This Committee consists of Mr. Albert Stokes as Chairman, Messrs. J. Ferguson Bell, J. E. Blundell, Fred Davies, Stephen Lacey, W. E. Price, Samuel Tagg, Frank P. Tarratt, and R. Hy. Ruthven as Hon. Secretary. Several meetings have been held, and the assistance of Mr. F. W. Harbord, F.I.C., Assoc.R.S.M., Consulting Metallurgist, has been obtained. The report of the Committee, together with draft of proposed specification which they recommend for adoption, will be communicated to the Institution at the annual meeting.

Institution of Civil Engineers Heat Engine and Boiler Trials Tabulation Committee.

This Committee has continued its work during the year. Several meetings of representatives of the co-operating bodies have been held. These bodies consist of the Institutions of Mechanical and Electrical Engineers, Naval Architects, Marine Engineers, North-East Coast Institution of Engineers and Shipbuilders, Institution of Engineers and Shipbuilders in Scotland, Institute of Chemistry, Institution of Gas Engineers, British Electrical and Allied Manufacturers' Association, British Engineers' Association, the Admiralty, the War Office, and the Air Ministry. The Institution's representatives on the Committee are Mr. W. Newton Booth, B.Sc., Mr. Walter Chaney, Mr. Harold Hollings, M.Sc. (taking the place of Mr. Stephen Lacey, B.Sc., who resigned), and Mr. E. W. L. Nicol.

Birmingham Medal.

The Council report with much gratification that the members of the Institution have unanimously endorsed their recommendation that the Birmingham Medal should be awarded in 1925 to Dr. Charles Carpenter, C.B.E., M.Inst.C.E. Arrangements have accordingly been made for its presentation at the annual meeting.

Shipping Engineering and Machinery Exhibition.

The Council have accepted an invitation for the Institution to be represented on the Committee of the Shipping Engineering and Machinery Exhibition which is to be held at Olympia from Nov. 23 to Dec. 5, 1925. Mr. Charles F. Botley, M.Inst.C.E., has been appointed to act in that capacity.

Public Works, Roads, and Transport Congress and Exhibition.

The Institution continues to be represented on the Permanent Organizing Committee of this Congress by its President and Secretary. The next congress is to be held at the Agricultural Hall, London, in November, 1925. One session is to be devoted to gas engineering, under the auspices of the Institution. A paper will then be read by Mr. C. S. Shapley, of Leeds, on "Public Lighting by Gas with Special Reference to Automatic Systems;" and another on "The Rating of Gas Undertakings," by Mr. George Evetts, of Westminster. Discussions will follow.

Royal Sanitary Institute.

Mr. R. E. Gibson and Mr. H. E. Stone represented the Institution at the congress of the Royal Sanitary Institute which was held at Liverpool from July 14 to 19, 1924.

Smoke Abatement League of Great Britain.

Recognizing the valuable work which is being accomplished by the Smoke Abatement League of Great Britain, the Council have made arrangements for the Institution to become an affiliated member of the League.

Education Scheme.

The report of the Advisory Committee on Education will be presented at the annual meeting. It indicates that satisfactory progress is being made in this important department of the Institution's work.

Refractories.

During the year the Joint Committee of the Institution and the Society of British Gas Industries has had the Standard Specification under revision. Amendments and additions are being completed for insertion in it. The Committee's report for presentation at the annual meeting of the Institution is now in course of preparation.

Mr. A. E. Broadberry having resigned from the Committee, of which he was the Chairman, Mr. J. P. Leather has been appointed in his place. The Council wish to record their sense of high appreciation of the valuable services rendered by Mr. Broadberry in assisting the work of the Committee during the period of his connection with it.

Gas Investigation Committee.

The work of this Committee and of its Research Sub-Committee has been continued partly in a laboratory provided by the Leeds Gas Department at the Meadow Lane Gas-Works, and partly on the new Corbet Woodall Experimental Gas Plant now attached to the Coal Gas and Fuel Industries Department at the University, Leeds.

The principal work in one branch, to which Mr. J. W. Wood has given his time, has been the continuation and development of those studies in the aeration of burners by injection which have already formed the subject matter of the Ninth and Eleventh Reports. The special subject of the year has been the investigation of lighting burners. In addition, careful work has been carried out in order to place the experimental determination of the specific gravity of gas on a better footing. The results obtained are embodied in the Thirteenth Report of the Committee.

Dr. Parker has been occupied in getting the Corbet Woodall Experimental Gas Plant into a proper condition for the carry-out of reliable work by its use and in the making of preliminary tests. It has been thought advisable to embody in the Fourteenth Report a complete description of the plant and its use, the constructions adopted, and difficulties encountered.

The Committee would like to acknowledge its indebtedness again to Mr. J. W. Wood and Dr. A. Parker, the Research Chemists in charge of the two branches of its work now reported upon, for the continuing zeal, ability, and initiative which they have brought to bear upon the work committed to them, with the valuable aid rendered by Mr. Howarth as assistant to Mr. Wood and by Mr. Kerr and Dr. Monkhouse as assistants to Dr. Parker. The opportunity is also taken of thanking Mr. C. S. Shapley and the Leeds Corporation Gas Department for the greatly appreciated facilities which they have continued to provide at the Meadow Lane Gas-Works.

Advisory Committee on the Livesey Professorship.

An arrangement was made this year by which this Committee and the Gas Investigation Committee were summoned for the same day, May 21, 1925, to meetings at Leeds, in order that members of the two Committees should meet one another

and have opportunities for inspecting the work of the Department both in research and teaching.

Prof. Cobb reported that research work had been active during the year, and that one addition had been made to the staff in the person of Mr. Geoffrey Claxton, M.Sc., who has been appointed to assist Mr. J. H. Hoffert, Chief Research Chemist of the Joint Benzole Research Committee of the University and the National Benzole Association. Research publications of the Department during the year include the reports of the Gas Investigation Committee (see above), of the Benzole Research Committee on the use of active carbon and silica gel for benzole recovery, and publications on the subjects of refractory materials and metallurgy.

As regards teaching, the normal day courses have been given, while the special evening lectures were given by Mr. Stephen Lacey, on the "Principles of Gas Distribution," Mr. C. F. Finn, on "Coke Oven Practice," and others. Students have assisted during test periods on the Corbet Woodall Experimental Plant.

Institution Gas Research Fellowship.

This appointment was resigned by Dr. Pexton on his appointment to the research staff of the Gas Light and Coke Company, and he has been succeeded by Mr. C. B. Marson (B.Sc., 1st Class Honours, Fuel and Metallurgy). During the past year Mr. Marson has been engaged upon the study of the influence exerted by the incombustible mineral matter of coal on the processes of carbonization and gasification with special reference to nitrogen and sulphur. The results obtained will be reported to the Institution at the annual meeting in the form of a joint paper by Mr. Marson and Prof. Cobb.

Corbet Woodall Scholarship.

Mr. A. G. Grant continues to hold this scholarship, and will be going up for his final pass Degree Examination for the B.Sc. in Gas Engineering in June. When the Pass Course is completed, Mr. Grant proposes to stay for a fourth year at the University, in order to undertake some research under supervision and present a thesis upon it for the Honours Degree.

Appointments Register.

The Council have instituted a register for the benefit of those members of the Institution who may be out of employment. The District Associations have been informed of the arrangement, and the ready manner in which they have promised to co-operate in the matter is much appreciated. Any members in a position to advise the Secretary of vacancies which are likely to arise are asked to send particulars to the office as soon as possible.

Library.

The donations to the library which have been received during the year are enumerated in an appendix. The Council gladly avail themselves of this opportunity of acknowledging the indebtedness of the Institution to those who have kindly presented them. The preparation of a new edition of the library catalogue is now in hand.

Accounts.

There is also appended a copy of the accounts for the year ended Dec. 31, 1924, duly certified by the Auditors (Mr. Sydney Y. Shoubridge and Messrs. Wood, Drew, & Co.).

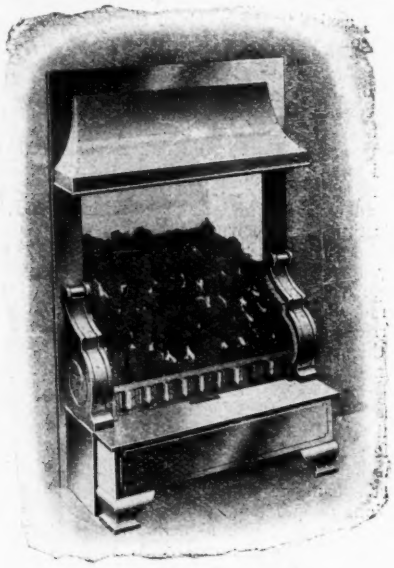
J. Ferguson Bell, *President*
Walter T. Dunn, *Secretary*.

May 22, 1925.

"SENTRY" GAS FIRES.

Readers of the "Journal" will be interested to learn that the manufacturers and patentees of the "Sentry" hot water boilers (Messrs. Wood, Russell & Co., of Nos. 34 and 36, Oxford Street, London, W. 1) have turned their attention to the production of a gas fire which has many attractive features, and of which three types—inset, self-contained, and dog grate—have been placed on the market.

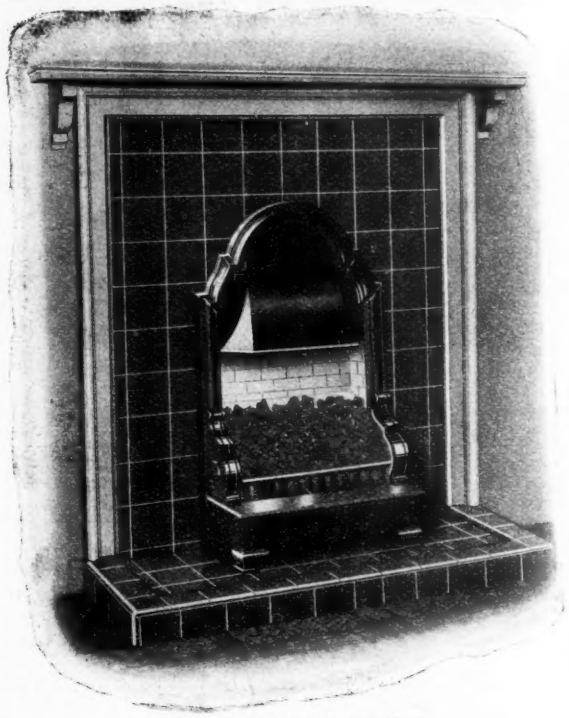
The "Sentry" inset fire should make a ready appeal to those who now have coal grates fitted in their houses, and are potential users of a gas fire embodying in a large degree the charm of the traditional coal grate, and who are at last realizing the enormous amount of labour, dirt, and dust created by burning coal. Great care has been taken to give the fire true architectural expression; and every consideration has been given to designing an efficient, hygienic, and silent burning fire which appears to be a component part of the existing grate.



"Sentry" Inset Fire.

The same fire unit in all its sizes is used for the "self-contained" type; the frame and canopy being designed in the decorative style of the William and Mary period, which lends a graceful and dignified effect. The frame projects only 1¼ in. from the face of the surround. Thus the self-contained fire has the appearance of a built-in model, and is easily fixed by a fitter, without the assistance of other skilled tradesmen. The canopy contains an ample hood for the removal of the products of combustion, and at the same time affords efficient ventilation of the apartment.

The dog grate is made in the 18-in. size, and is fitted with an iron fireback of the "Sussex" type. It is designed expressly to fit into existing tile and brick recesses where the other types of fire would not be suitable.



"Sentry" Self-Contained Fire.

An important feature of the whole series of "Sentry" fires is that the measurement representing the size of fire is the actual width across the radiants. Thus, a 14-in. fire fits the ordinary 14-in. coal grate and is actually 14 in. across the radiants; there being no unnecessary thickness of the firebrick cheeks to give apparent increased width.

A unique feature of the "Sentry" is the introduction of a radiant combining the advantages of the vertical radiant with the charm of the loose black fuel. While an inclined pattern of fire can obviously be made more nearly to resemble a coal fire, this has hitherto been effected at the expense of direct radiant heat. In the "Sentry" fire, however, the lower and vertical portion of the radiant is unobstructed, and direct radiation is assisted by a highly-polished trivet and fuel bar.

Messrs. Wood, Russell & Co. have recently opened extensive showrooms at the address given above, where the new series of "Sentry" fires are displayed in attractive mantel settings. The decoration and reconstruction of the showrooms has been designed by Major F. Cornelius Wheeler, who was Manager of the Nautilus Fire Company before going into partnership with Messrs. Wood, Russell & Co. All interested in the recent developments in coke and gas apparatus should make a point of visiting the showrooms.

NORTH OF ENGLAND GAS MANAGERS' ASSOCIATION.

Auxiliary Section Meeting.

The Twelfth Half-Yearly Auxiliary Meeting of the Association was held on Saturday, May 23, in the chemistry laboratory of the Armstrong College, Newcastle. Dr. GEOFFREY WEYMAN, Chief Chemist to the Newcastle and Gateshead Gas Company, presided over a good attendance.

The Chairman, in opening the proceedings, thanked the members for the honour they had done him in electing him Chairman for the current year.

ADDRESS.

By Dr. GEOFFREY WEYMAN.

While the saying that "it is a poor workman who blames his tools" often contains a good deal of truth, yet it is wise periodically to examine our tools to see if they are really capable of doing their proper part. The tools of the gas technician consist of plants of very varied types, and have to deal with a large variety of materials, including solids, liquids, and gases. In making a hurried review of these tools, I am taking up the attitude of the lazy workman who is finding all the faults he has heard of in the particular implement he is supposed to be wielding, not so much as regards the strength or endurance of his tool as in the efficiency with which he can use it.

Far too much of the plant seen in operation is a more or less confused tangle of pipework, tanks, and units of various types. Many of the chief means of control are in almost inaccessible places. The operators are unnecessarily large in number, and have to exert themselves physically to an unjustifiable extent. Those in charge realize only too well what it means to work a badly-designed and ill-arranged plant; and it behoves us to consider seriously how this defect can be avoided. Most plants are now largely designed and erected by firms who make the different units. These plant makers are naturally anxious to standardize their products as far as possible, and are chary of accommodating their designs to suit local conditions. But, to give the best results, plants must be adapted to local conditions; for it is a fact that identical plants may give varying results in different situations, not only so far as general economy goes, but even in regard to efficiency. Plant makers must necessarily obtain their experience of large-scale working at the user's expense; and, when once a plant has been evolved and placed on the market, they too often lose touch with the small details which contribute so much to successful results. The only party really in a position to appreciate the problem and formulate an economical plant is the user himself. The guarantees so often insisted upon are after all only a paper safeguard. A penalty may be enforced for some loss of efficiency, but no plant maker can or will give any assurance against uneconomical working. It is, of course, the economy which counts—the relation of costs to value of output—and as often as not it pays to sacrifice efficiency in some direction for the sake of economy. The plant user has, in fact, to face the responsibility in any case, and must decide for himself which type of plant will work best under his particular local conditions.

In recent years the education and training of technical staffs both in the gas and other industries has so greatly improved, that there is no adequate reason why the design and arrangement of all plant should not be systematically considered, and the plant makers given the necessary plans and specifications enable them to put forward a product suitable in design and convenient in arrangement for each particular set of conditions.

To plan successfully requires imagination. The faculty of greatest importance is that of visualization; the power of forming mental pictures, not only to "see through a brick wall," or more commonly an iron plate, and to picture the other side, but also to form moving pictures in which the various parts of the plant or apparatus are actually functioning as in practice. Many plants would certainly not be in existence to-day if the designers had only visualized them in operation, had realized the effect on the plant when it was overloaded or underloaded, and had seen the operators working under adverse conditions. The final drawings of any proposed plant should most certainly emphasize the position of the controls and the sphere of each workman to be engaged.

An important point to be considered is the amount of capital justified. The expenditure of either too much or too little capital places a severe handicap on the plant. This expenditure will depend on the capacity of the plant, on the system of operation, and on local circumstances. A portion will be devoted to labour-saving arrangements, and another portion to plant for saving materials, including steam and water. The expenditure in each of these directions must be considered if the real economical limit is to be fixed. It is necessary that the capacity of the plant shall have a close relation to that normally required. With a given plant the labour costs, repair and maintenance, and capital charges tend to remain the same whatever the output may be. Even the material charges are sometimes heavier for an under-worked plant. In gas-works most of the plant is subject to a variable load, and this is a great handicap. In many cases variations can be overcome by storage accommodation, and if plant of the continuous type—for example, sulphate plant—is worked only at intervals. The trouble of course, is that labour is difficult to absorb in the "off" periods, and the capital and a portion of the repair and maintenance charges are running-on while the plant is standing idle. An alternative is to use smaller plant units, in which case the capital cost per unit of production will be higher and the labour costs also increased. Apart from other considerations, some units of plant—for example, heat interchangers—cannot be worked efficiently at much higher or lower than a definite capacity. Other types do not suffer to any great extent, and a compromise is often advisable, in which certain units are installed of high capacity and worked intermittently, while the rest are worked continuously on a smaller but definite load.

Another consideration is the effect of working losses of materials; and for this reason it may be best to keep the capacity on the high side and use the units less frequently. An example of this is the acid washer of a benzole-refining plant. A further consideration lies in the possibility of future increase in production. Unless the future increase is very definite, it is not advisable to risk incurring increased costs and capital outlay in designing a plant of such a capacity as to absorb this increase. A better plan is to compromise in the installation of large units in those instances where the efficiency is not interfered with, and to allow for duplication of units in other cases.

The system of operation may be either continuous or intermittent. The continuous system has the advantages of lower capital charges per unit of production per day, and lower depreciation charges. There is also less loss of material, and the wear and tear of the plant is smaller by reason of the elimination of the strain of starting and stopping. On the other hand, labour costs are at a higher level owing to the extra cost of shift work, and there is some loss of efficiency owing to poorer control on the night shift. Some operations do not lend themselves to continuous working—for example, rectification for pure products by distillation. In a general sense the continuous system is preferable for the production of crude products, especially if the concentration is low, and intermittent working for the last stages of refinement.

In regard to labour, one point might be emphasized; and that is, that, as replacement of men by mechanical appliances proceeds, the remainder have to be more skilled and more highly paid. The replacement becomes much less profitable as it proceeds; in other words, the capital needed to replace a workman increases very rapidly. The first step might cost about £1500; the second well over £2000.

As an example of local conditions affecting the design of plant, there might be instanced the need of some means of heating purifiers in exposed places on the North-East Coast, as compared with the absence of such necessity in sheltered positions in other parts of the country. A more important instance is the design of retorts situated on this coalfield as against that of plants placed in the Yorkshire coalfield. Distinction must also be drawn between units which are affected by exposure to the atmosphere and others which it is imperative to house.

The materials form a most important item in costs, often amounting to three-quarters of the whole; and considerable expenditure is justified to effect a reduction either by way of lowering the first cost of material or of increasing the efficiency with which materials are handled and used.

In considering plant for process work, it is useful to classify it according to the prime object in each case. There are three main classes—the preparation plant, reaction plant, and separation plant. A subsidiary class can be called "interconnection plant." In the preparation plant the materials are brought into the best physical condition—into a sufficiently concentrated form and under suitable degrees of temperature and pressure. The materials are then in a fit state for chemical reaction.

The reaction plant, which must necessarily be carefully controlled to give really economical working, can be made fairly simple if proper attention is given to the preparation plant. The products of reaction are then dealt with in the separation plant, which separates the various products, and refines or brings them to suitable physical state and concentration for the market. In many cases the separation plant follows on similar lines to the preparation plant, but is usually of a smaller capacity and more delicate in operation. It should certainly be at least as efficient, as it deals with the raw materials on which money has been spent and the value of which is approaching that of the final product. In a sense it is more important than the separation plant, because of the enormous difference in value which occurs in the last stages of refining.

The development of plant for process work largely consists in the extension of the preparation and separation plant, in order that the work of the reaction plant may be simplified and this part of the plant brought under better control. The first form of plant evolved is often a large and clumsy unit, in which materials are more or less mixed up to give contact, and the products roughly separated at the same time. As the process develops, additional units are specially designed and added to prepare the materials or separate the products while the reaction plant is reduced in size. As each unit now has a particular object, it can obviously be made more efficient.

Let us follow this line of thought for a moment, and see what it suggests in regard to gas-works plant.

Carbonizing Plant.—It is unfortunately the fact that the only preparation plant for coal in use on gas-works consists of a coal breaker to reduce the size of large pieces. So far as this is concerned, the important point is that no additional dust should be made, and it is preferable therefore to screen the small coal out, and only send the large to the breaker. So much depends on the treatment of coal prior to carbonization that it seems a pity that the screening, picking, and washing plants are all situated out of control of the gas-works. A point to which insufficient attention has been directed is towards securing uniformity of the chief raw material. There is no doubt that a considerable proportion of capital ought to be devoted to this object, as real economy cannot be secured in the retort house if the coal used is varying from retort to retort and from hour to hour. Again, in view of recent investigations, the inclusion of blending plant for properly mixing-in coke breeze or non-caking materials must be considered.

Reaction Plant.—The retort proper forms the reaction plant, and needs to be designed for the particular coals to be dealt with, and for the type of product resulting from it. We have no control over the coal once it is charged, except to a limited extent in continuous vertical retorts, so that practically everything hinges on the state of the coal prior to charging. It seems to me probable that the various differences in opinion which exist as regards the best size and shape of retorts to employ have arisen owing to the variation in coal used by the respective experts.

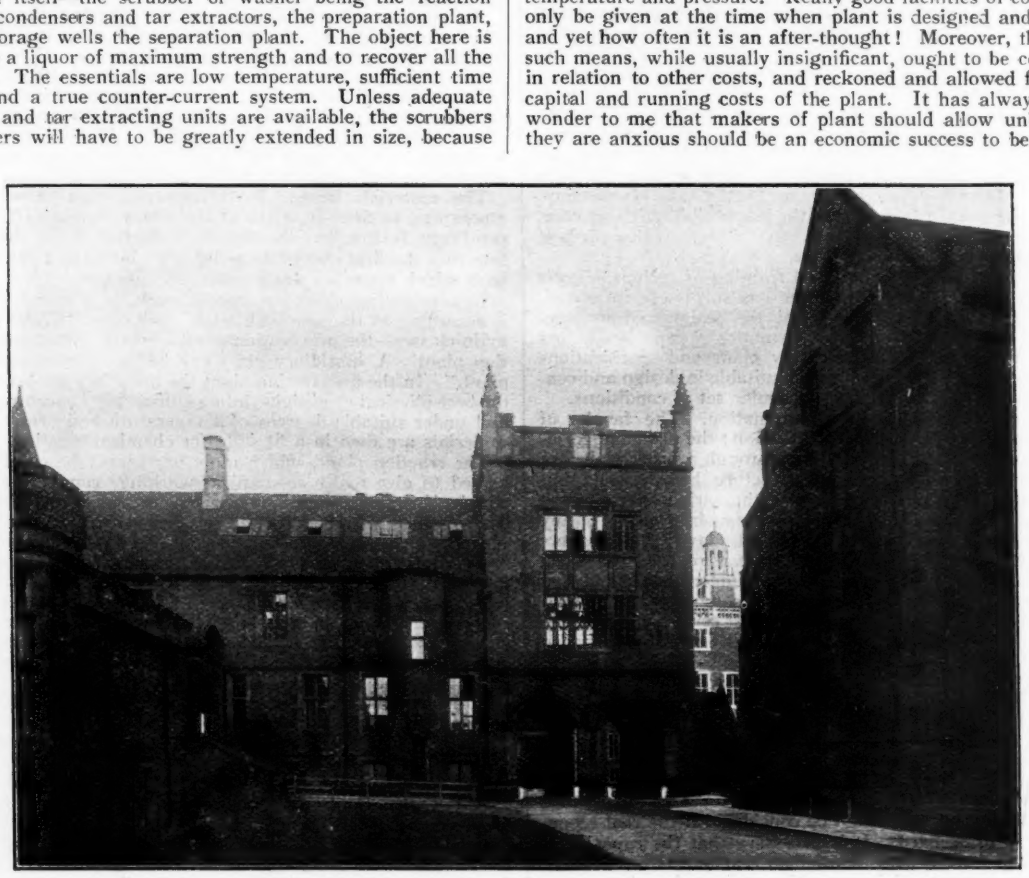
Separation Plant.—This consists of condensers, scrubbers, and purifiers. The condenser separates the tar and liquor from the gas, and incidentally withdraws heat from the gas. The question at once arises, How can this heat be utilized? In the days of intrinsic illuminating power the water-cooled condenser was not suitable, because the sudden chilling robbed the gas of a considerable proportion of its candle-power. To-day this condition is somewhat altered, as the reduction in calorific value by this means is not nearly so great. With the atmospheric cooler the heat cannot be recovered, but with the water-cooled condenser it can. The latter then becomes a heat-interchanger, and must be designed for that purpose. Usually the heat interchange is effected between the gas and boiler feed water, but it is a moot point whether the heat could not be more usefully employed at the purifiers—being transferred, either by a double interchange or by using the cold gas as the cooling medium in the condensers, before the purifiers.

Scrubbing Plant.—The scrubbing plant can be considered as a plant in itself—the scrubber or washer being the reaction unit; the condensers and tar extractors, the preparation plant, and the storage wells the separation plant. The object here is to produce a liquor of maximum strength and to recover all the ammonia. The essentials are low temperature, sufficient time contact, and a true counter-current system. Unless adequate condenser and tar extracting units are available, the scrubbers and washers will have to be greatly extended in size, because you cannot get proper contact when tar is present. In fact, as the scrubbing plant is reduced from sets of large tower scrubbers to the equally efficient but smaller and more delicate centrifugal washers, so the necessity arises for the more extended and efficient preparation plant, which takes shape in two directions—the purifying of the gas from tar, and of the water from substances which would be precipitated in the reaction vessel. It is, in fact, fatal to use water which has a high temporary hardness in a centrifugal washer if the gas also contains tar. So far as the separation plant is concerned, it is usually conspicuous by its absence, and in some cases cold liquor and hot tar are dumped in the same storage well under conditions which must obviously lead to loss of ammonia and bad separation.

Oxide Purification Plant.—This should be shown the same consideration. In order to reduce the size of the reaction plant—the purifiers—and also the amount of oxide used as a catalyst, it is necessary to use preparation plant for raising the temperature of the gas to that required for rapid reaction, and to bring the oxide used as a catalyst to a suitable physical and chemical state. In both these instances the ordinary gas-works plant can hardly be considered complete; and there would appear to be possibilities, which have not been sufficiently explored, of reducing the size of purifiers to at least one-hundredth of their present size. It is true that in many cases steam-heated coils are used in the boxes, but a little reflection will show the utter incapacity of such coils of reasonable size to influence the temperature of the huge volume of pas passed or the 100 tons or so of oxide enclosed in the metal box. Again, we are faced by the fact that no separation plant is used to concentrate or improve the quality of the spent oxide; and in view of the fact that materials such as pan-ashes of very low value can be economically concentrated, it should not be impossible to separate the mixture of oxide of iron and sulphur in an economic manner.

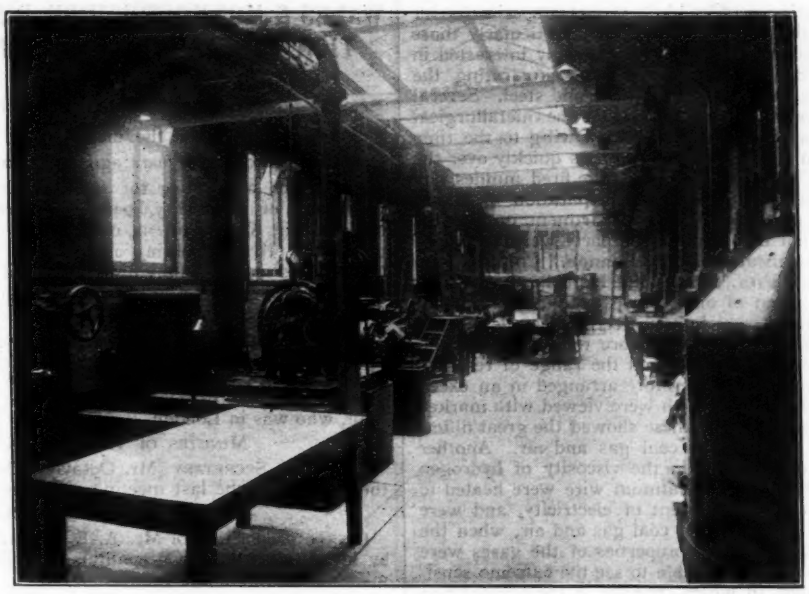
This short review will indicate the utility and suggestiveness of classifying plant, and how it is possible to arrive at an economic balance between the different portions of a plant.

Finally, there is one very important adjunct of plant which is still much neglected, and that is the means of control and the facilities for control. As development of plant takes place, so the operation becomes more intricate, and so the necessity arises for delicate means of control. If plant is to work with maximum economy, it is essential that we should know both when it reaches this desirable level and also the conditions under which this state of affairs is maintained. To obtain this knowledge, we must have means of measurement of both quality and quantity, besides the means of ascertaining such conditions as temperature and pressure. Really good facilities of control can only be given at the time when plant is designed and erected; and yet how often it is an after-thought! Moreover, the cost of such means, while usually insignificant, ought to be considered in relation to other costs, and reckoned and allowed for in the capital and running costs of the plant. It has always been a wonder to me that makers of plant should allow units which they are anxious should be an economic success to be installed



ARMSTRONG COLLEGE OF SCIENCE.

Art Department on left; Chemical Department on right; tower of new Union in the background.



HYDRAULIC LABORATORY—ENGINEERING DEPARTMENT.

without any means whatever of ensuring, by proper control, that they are so.

There was no discussion.

Mr. L. M. WELDON (West Hartlepool) moved a vote of thanks to Dr. Weyman for his address, which, he said, had been prepared on broad yet definite lines.

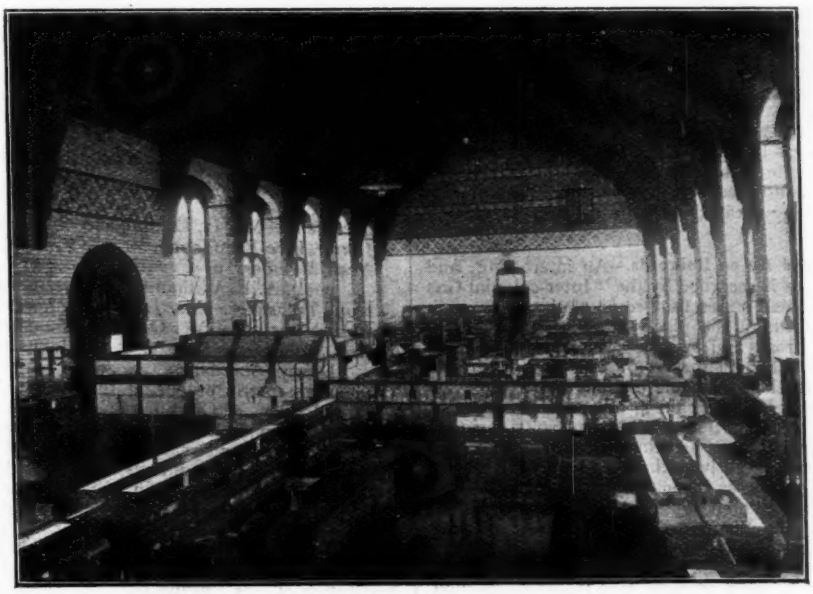
Mr. H. GREIG (Sunderland) seconded, and remarked that the paper had given them something to think about. His subject was appropriate in view of the opposition which the gas industry had to meet from electricity concerns.

INSPECTION OF ARMSTRONG COLLEGE.

At the conclusion of the meeting held in the main chemical lecture theatre, the visitors proceeded to inspect the laboratories of the Departments of Chemistry, Engineering, Metallurgy, and Physics. Mr. Robinson guided the party round the Chemical Department, showing first the research laboratory devoted to work on the sugars—a particular study of Prof. Haworth's. The chemical library is well situated between the laboratory and the room in which apparatus mechanically operated is installed. A vacuum dessicator, Langmuir's mercury-pump, and a laboratory centrifuge were noted. Here the party were greeted by the Principal of the College, Sir Theodore Morrison. Accompanied by Prof. Haworth the party passed through the laboratory devoted to organic chemistry and to the Johnstone laboratory, a particularly fine and spacious room. A well-equipped balance room and lecturers' laboratory were visited. It was explained that the laboratories for physical chemistry were at present situated in temporary buildings outside the main building. The visitors were interested in a darkened laboratory where work on silver salts is proceeding under the direction of Dr. Briscoe. A particularly sensitive chemical balance was exhibited. A well-fitted glass-blowing room was seen in which all special glass apparatus is made as required. Prof. Haworth said how pleased he had been to welcome the party and to receive fresh proof of the interest in chemistry shown by the many branches of industry.

The party next passed on to the large engineering drawing office, and under the guidance of Mr. Martin were shown the various machines and testing appliances. It was explained that, owing to the installation of a new boiler house, it had become necessary to re-arrange most of the machines, grouping those using steam in a new building next to the boiler house, and replacing most of the other units. Among the numerous machines were noted a Diesel engine, a 100-ton Buckton testing machine, and a Martin-Avery testing machine. The large hydraulic laboratory equipped with different examples of turbines was much admired. The visitors passed on to the new boiler house, where three mechanically stoked Lancashire boilers supply the steam for heating the College buildings. These boilers, like all other plant, are suitably fitted so that the students may make all necessary tests and trials. There were also water-tube boilers in course of erection. In the steam engine section a variable multiple expansion engine and a recently-acquired experimental type of Parsons steam turbine were noted.

Passing on to the Metallurgical Department, the party were received by Dr. Smythe, who had arranged a demonstration



THE JOHNSTONE LABORATORY—CHEMICAL DEPARTMENT.

showing the preparation and etching of metal specimens for microscopic examination. The visitors—and particularly those concerned with the distribution side—were keenly interested in the specimens shown under the microscope illustrating the difference in structure between wrought iron and steel. Several members registered a resolution to develop the metallurgical examination of materials in their works. Owing to the time spent in this direction it was necessary to pass quickly over the other sections of the laboratories where coke-fired muffles and furnaces, for the reduction of ores and preparation of alloys, were grouped. The extension of the Department outside the main building could not be visited. The party were welcomed at the physical lecture theatre by Mr. Lunnon. Consideration for the visitors had led Prof. Stroud and his colleagues to believe that a demonstration of one or two experiments dealing with physical phenomena which have received application in the gas industry would be welcomed more than a cursory inspection of the Herschel laboratory and the range of research laboratories. Mr. Lunnon had therefore arranged in an excellent manner a few experiments which were viewed with marked interest by the members. One of these showed the great difference in the power of diffusion of coal gas and air. Another illustrated the marked difference in the viscosity of hydrogen and oxygen. In a third, coils of platinum wire were heated to the same degree by a similar current of electricity, and were immersed respectively in streams of coal gas and air, when the effects of the different conducting properties of the gases were clearly visible. The visitors were able to see the extreme sensitiveness of an instrument in which changes in the composition of gas causes a movement in the interference colours.

The party concluded the proceedings with tea served in the new Union building recently erected through the generosity of an anonymous donor.

The Chairman proposed a vote of thanks to the Principal of the College, to the Heads of the Departments visited, and to the guides who had shown them round. He said that some fifteen years ago, when he passed through the College, it was certainly the hardest working College in the country. From what they had seen he could believe that it was still so; but he was glad to find that two needs felt very much in his day—playing fields and adequate Union accommodation—had since been filled through the generosity of private individuals. The College had expanded in all directions; but it was tragic to find its work hindered by lack of finances. He felt it ought to be more supported by local industry; and since the gas industry was dependent on coal, he wondered if development might not take place in the direction of some department concerned primarily with the study of the constitution and peculiar properties of coal, for which all the sciences were needed. Their visit that afternoon had been of great use to them; and he felt justified in asking the members not only to support the vote of thanks, but to register a resolve to make the utmost use of the College.

Mr. Copland (Newcastle) seconded, and referred to the development and complexity of modern plant and machinery.

Dr. Smythe, on behalf of the College, thanked the members. The complexity of modern industrial plant had been referred to by Mr. Copland; and he could not see how it was possible for those taking part in industrial life to do without such a training as provided at the Armstrong College.

Petrol for Starting Gas-Engines.—According to the "Engineer," a recent issue of "Vulcan" contains a warning about the use of petrol in starting gas-engines. In the case under review the engine would not start with gas, so some petrol was poured into the air inlet silencer. The engine then started readily and began to race. Shutting the gas inlet valve was of no avail; and an accident was only averted by tearing the ignition wire from the plug. It was found that nearly 2 gallons of petrol had been poured into the silencer; and this provided a large supply of fuel uncontrolled by the governor. When petrol is used, it should only be sprayed into the cylinder in definite small quantities.

Gas to Melt Snow and Ice on Railroads.—An interesting, and perhaps novel, use of gas is recorded by the "Inter-colonial Gas Journal of Canada," which states that some of the steam railroads are using gas to take the place of snow shovellers in freight yards, to keep frogs and switches cleared of snow and ice after heavy storms. The Pennsylvania and Erie Railroads have adopted the gas method for some of their important New Jersey yards. A convenient gas main is tapped, and a line of hose conducts the gas to the switches, where specially designed burners are placed. The burners are clamped between the ties to both rails, and when lighted heat the rails to such a degree that the snow and ice in the area is melted. Each set of burners does as much work as four men could do in the old way. In the Waverley yards of the Pennsylvania Railroad at Newark there are 172 gas burners, which consume 4300 c.ft. of gas per hour. These are connected to the street main at New Jersey Railroad Avenue, Newark, by a pipeline 2000 ft. long. Similar burners are also used in the Trenton yard of the Pennsylvania Railway and in the Rutherford yard of the Erie Railway.

WALES & MONMOUTHSHIRE DISTRICT INSTITUTION OF GAS ENGINEERS AND MANAGERS.

General Meeting at Porthcawl.

So enjoyable proved the meeting held by the Institution at Porthcawl barely two years ago, that it was again decided upon as the place of meeting for the gathering last week; and an attendance of some fifty members proved the wisdom of the choice. Mr. W. H. Johns, of Swansea (the President) was in the chair. In the morning a paper by Mr. H. D. Madden, of Cardiff, was read and fully discussed; and after lunch, a pleasant afternoon was spent in bright sunshine and the invigorating air of the popular South Wales watering place.

The meeting was held in the Council Chamber, and was opened by Mr. Davies (the Vice-Chairman of the Porthcawl Urban District Council), who heartily welcomed the members to the town. He expressed regret at the absence of the Chairman, who was in London.

Minutes of the Last Meeting.

The Hon. Secretary (Mr. Octavius Thomas, of Pentre) read the minutes of the last meeting, and they were confirmed.

The Institution Roll.

On the proposition of Mr. A. E. Davey (Aberdare), seconded by Mr. B. Grainger (Caerphilly), the following additions were made to the roll of the Institution:

Members.

Mr. James Allen Cunniffe, Superintendent, Morriston Gas-Works, Swansea.

Mr. Thomas Watson Little, Manager, Gas-Works, Mitcheldean, Glos.

Students.

Mr. John Martin Randell, Swansea.

Mr. Colin Ronald Monroe, Cardiff.

An Honorary Member.

Mr. J. H. Canning (Newport) proposed the election of Mr. R. G. Clarry, M.P., as an honorary member of the Institution. He had a great many friends in the gas industry; and though he was now in Parliament, his interest in the industry was as great as ever.

Mr. H. D. Madden (Cardiff), in seconding, said Mr. Clarry had done much for their Institution, but he was doing even greater work for the whole industry in Parliament, by the Bill he was promoting to give powers to gas companies to provide electricity.

The President remarked that, as Mr. Clarry's successor at Swansea, he would like to support the proposal; and the meeting heartily endorsed it.

Annual Report.

The Hon. Secretary then read the twentieth annual report of the Council, which stated that during the year three members and two students had joined the Institution, and six members and one student had resigned, leaving the number at the end of the year at 72 members, 8 students, and 1 honorary member. The receipts for the year amounted to £79 15s. 6d., and the payments to £75 9s. 8d., leaving, with the balance brought forward from last year, the sum of £43 2s. 2d. in the Treasurer's hands, together with £100 of 2½ p.ct. Consols.

Arrangements are being made to start classes in Gas Engineering and Gas Supply at Cardiff and Swansea during the coming winter, which the Council hope will be taken advantage of.

Mr. E. Ablett (Swansea) proposed the adoption of the report and accounts, remarking that both were very satisfactory.

Mr. H. D. Hazell (Newport) seconded the motion, which was carried.

New Office Bearers.

The following were elected office-bearers for the ensuing year:

President.—Mr. H. D. Madden, of Cardiff.

Junior Vice-President.—Mr. A. T. Kyle, of Abergavenny.

New Members of Council.—Messrs. T. B. Pearson (Pontypool), A. E. Williams (Cardiff), and E. Petty (Hirwain).

Hon. Treasurer.—Mr. J. H. Canning, of Newport.

Hon. Secretary.—Mr. Octavius Thomas, of Pentre.

Hon. Auditors.—Messrs. J. H. Jones (Dowlais), and A. E. Davey (Aberdare).

The President, proposing the election to the chair of Mr. H. D. Madden, of Cardiff, remarked that it was not necessary for him to say much about that gentleman, because they all knew him well and realized that he had always put forward every effort in the best interests of the Institution, and in everything that he undertook on behalf of the industry. He had been their President on a former occasion, and they would be greatly honoured by his becoming so again. It was extremely gratifying to them and to all his many friends to find that he had also been nominated Junior Vice-President of the Institution of Gas Engineers.

Mr. Canning seconded; remarking that they esteemed Mr. Madden, not only for his pre-eminence in everything that per-

tained to his profession, but also for those personal qualities which had endeared him to all of them. Since he had been in that district, he had done everything possible to help his colleagues, and had made friends everywhere.

Mr. MADDEN thanked the members very much for honouring him by asking him to accept the Presidency for a second time during the comparatively few years that he had spent among them.

Mr. H. BARKER (Llanelly) proposed Mr. A. T. Kyle's election as Vice-President; and Mr. W. CLARK JACKSON (Neath) seconded—pointing out that Mr. Kyle had been with them a long time, and had taken an active part in Council matters.

The PRESIDENT proposed Mr. Octavius Thomas's re-election as Hon. Secretary, saying he did not know what they would do if he found it impossible to continue in this and the other offices he was so ably filling for the industry in that part of the country.

Mr. A. T. KYLE (Abergavenny) seconded the motion.

LETTER FROM THE PRESIDENT OF THE INSTITUTION OF GAS ENGINEERS.

The HON. SECRETARY then read the following letter, which had been received from Mr. J. Ferguson Bell, the President of the Institution of Gas Engineers:

> I regret nearness of the annual meeting of the Institution of Gas Engineers prevents my accepting your very kind invitation to be present at a meeting of your Institution to be held at Porthcawl.
>
> I am very pleased to observe that you propose to elect Mr. R. G. Clarry, M.P., an honorary member, in recognition of his valuable services rendered to your Institution. May I add that Mr. Clarry has given very valuable assistance in many ways to the gas industry?
>
> In addition, I should like to take this opportunity to thank the Wales and Monmouthshire Institution for their support of the Institution of Gas Engineers' Benevolent Fund.
>
> I look forward to the pleasure of seeing a good many of your members at the annual meeting of the Institution of Gas Engineers.

BENEVOLENT FUND OF THE INSTITUTION.

The HON. SECRETARY proposed that a contribution of five guineas should be made to the Benevolent Fund of the Institution of Gas Engineers; and he also appealed to those members who did not do so to subscribe individually. There had been a very sad case of one of their own members who died suddenly; and fortunately he (Mr. Thomas) was able to get a substantial grant for the widow. More money was wanted; and he hoped that members would see what they could do. Even sums of a few shillings would be gratefully received by the Institution of Gas Engineers.

Mr. J. ROBB (Chepstow) seconded the proposal, and it was agreed to.

RULE 2 AMENDED.

Mr. MADDEN moved that Rule 2 of the Institution be altered to read:

> "That the Institution shall consist of members, honorary members, and students. Members and honorary members shall consist of engineers, managers, assistant engineers or managers, and technical assistants, whose qualifications shall not be less than those involved by the possession of the Higher Certificate of the Institution of Gas Engineers in Gas Engineering or Gas Supply, and who are in the service of gas companies or local authorities. Students to be pupils under the training of Engineers of gas-works in the service of gas companies or local authorities."

He pointed out that this meant the opening of the doors of the Institution to those men who could secure the Higher Certificate of the Institution of Gas Engineers in either Gas Engineering or Gas Supply. He thought the Council had made a right move in this matter. As one who knew a little of the inside working of the Education Scheme, he could say that for a technical assistant to obtain the Higher Certificate was no easy thing. His qualifications must be good before he was allowed to sit. The amended rule would be an encouragement to the younger members of the profession to do their best.

The HON. SECRETARY seconded, and pointed out that the proposal would only apply to future members.

A MEMBER'S RETURN.

The PRESIDENT said they had with them one of their members, Mr. William Collin, who had spent some time in Chili—at Coquimbo and Talcahuano. They were all very pleased to have him with them once again.

GENERAL SALES PROPAGANDA.

Mr. MADDEN then read a paper on "General Sales Propaganda," which, with a report of the discussion, will be published next week.

Before the meeting closed, a vote of thanks to the Chairman and members of the Porthcawl Urban District Council, for their kindness in granting the Institution the use of the Council Chamber, was passed on the proposition of Mr. JACKSON, seconded by Mr. BARKER.

Acknowledgment was made by Mr. F. JAMES (the Chairman of the Gas Committee).

The members then had lunch together in the Pier Hotel, after which Mr. Madden submitted the toast of "The Porthcawl Urban District Council," coupling with it the name of Mr. James, who responded. Councillor Griffin proposed "The Wales and Monmouthshire District Institution of Gas Engineers and Managers," remarking upon the indebtedness of the Porthcawl gas undertaking to both the Institution and Mr. Thomas. The President, in his reply, emphasized the many advantages possessed by combined gas and electricity undertakings.

CHEMICAL ENGINEERING GROUP.

Annual General Meeting.

The Annual General Meeting of the Chemical Engineering Group of the Society of Chemical Industry was held at the Chemical Industry Club, Whitehall Court, London, on Friday, May 29, and was preceded by an informal dinner, at which Mr. W. J. U. Woolcock, C.B.E. (President of the Society of Chemical Industry), was entertained. Mr. C. S. Garland (Chairman of the Group) presided.

The report of the Committee of the Group, which was unanimously adopted, recorded that the year's work had been carried on with noteworthy success, and that even better results are anticipated in 1925. Membership has increased from 315 in 1922 to 408 in 1924.

It has been the policy of the Group to co-operate with the various sections of the Society of Chemical Industry, and with other scientific institutions, in the holding of joint meetings, in addition to its own meetings; and this policy is to be adhered to in the future. There were a number of joint meetings held in 1924 in London and the Provinces, all of which were well attended, and provoked interesting discussions. The relations between the Group and the parent Society continue to be most cordial, and the Group is working in close co-operation with the Institution of Chemical Engineers in matters affecting their joint interests. At the Conference of the Smoke Abatement League at Manchester, in November, 1924, the Group was officially represented.

Attention was given in the report to the World Power Conference, held at Wembley from June 30 to July 12 last year, the Chemistry and Physics Section of which was organized by the Group at the request of the Society of Chemical Industry, and under the *ægis* of the British Electrical and Allied Manufacturers' Association. It was stated also that the Gas and Fuel Section of the Conference, which was organized by the National Gas Council, developed from the initial work of the Group Committee.

Reporting Accidents with Gas.

The Pacific Coast Gas Association have been taking pains to investigate accidents occurring with gas. During the eight months beginning with last August, an account was kept of reports appearing in the Daily Press of accidents to the public with gas in all Pacific Coast States; and the Secretary, realizing that the haste with which newspapers prepare their copy often leads to inaccuracy, attempted to verify the statements appearing in the Press. A letter was written to the gas company upon whose district an accident had been recorded, requesting the results of any investigation that might have been made, in order that this could be compared with the newspaper statement. Out of 31 replies containing sufficient detail to permit of a definite conclusion being reached, the significant facts emerge that in only six of the cases was the accident reported with reasonable accuracy by the Press; and that in ten instances the report was entirely incorrect, and gas either had nothing whatever to do with the accident, or was merely an "accessory after the fact."

Refining of Crude Tar Oils.

Abstracting an article from the "Technische Blaetter," on the subject of the refining of crude tar oils, the "Bulletin of the Cleveland Scientific and Technical Institution" says that these oils, especially the high boiling-point fractions, have a tendency to darken in storage, which unfits them for many purposes. Purification with sulphuric acid, as is common practice in the petroleum industry, will not do in this case, neither will liquid sulphur dioxide, although aqueous sulphuric acid is employable. It has now been found that these oils—and particularly such of their fractions as boil at over 200° C.—can be purified or refined by treating with alkalies or alkaline media. For this purpose they are mixed with small quantities of solid alkalies; heated with return-condensation; and then distilled-off from the residue. This process loses very little oil, and uses only a small quantity of purifier—the greater part of which can be regenerated. The advantages as against the aqueous sulphuric acid method are that the process can be carried out in any kind of iron vessel, and that it is speedy. It is suitable for purifying neutral as well as acid oils, and also unseparated mixtures of same such as occur in tar distillation. The process is covered by a German patent.

ABERDEEN GAS-WORKS.

Official Inspection.

On Monday, May 25, an official inspection of the works of the Aberdeen Corporation Gas Department was made. To mark the occasion, an illustrated brochure, descriptive of the undertaking, was prepared, from which we take the following few extracts.

HISTORICAL.

The Aberdeen Gas Light Company came into being in the year 1824. During the first four years of the Company's life only oil gas was manufactured, and the price charged was from 50s. to 40s. per 1000 c.ft. In 1828, the Company dropped the use of oil, and commenced the manufacture of coal gas, when the price of gas immediately fell to 15s. per 1000 c.ft. The success of the original Company led, in the year 1844, to the formation of a competitor, the Aberdeen New Gas Light Company, who erected their works at Sandilands, on land which now forms part of the present gas-works. Gas at this time was charged at 9s. per 1000 c.ft. It was soon discovered that it would be expedient to amalgamate the two Companies; and this amalgamation took place in 1846, when the manufacturing operations were concentrated at the Sandilands site. In 1871 the Gas Company's undertaking was transferred by Act of Parliament to the Town Council of Aberdeen. Gas at this time was 5s. 5d. per 1000 c.ft.

The remarkable progress of the undertaking since the date of transfer may be seen from the following table:

Table Showing Progress of the Undertaking During the Last Fifty Years.

—	Gas Made. C.Ft.	Gas Rental.	Residual Products.	Price per 1000 C.Ft.
			£	s. d.
1874	172,171,000	36,074	2,911	5 0
1884	286,770,000	47,590	7,986	3 10
1894	430,569,000	65,440	11,011	3 5
1904	649,049,000	93,974	21,090	3 0
1914	989,598,000	107,235	39,493	2 3
1924	1,440,715,000	166,131	87,026	2 6

The Sandilands site occupies an area of 9¾ acres, while the gas storage site, situated about half-a-mile distant, extends to 4½ acres.

The gas-works are about three-quarters of a mile from the Railway Station, but are connected by a railway with the various yards and the harbour—Corporation locomotives being employed to handle the traffic.

CARBONIZING PLANT.

The carbonizing plant now consists of 432 horizontal retorts arranged in beds of eight, and comprising four benches, operated by mechanical stokers, and two installations of Woodall-Duckham vertical retorts—the latter having a total carbonizing capacity of 292 tons of coal per 24 hours.

In 1899 and 1901, inclined retorts were erected by way of experiment. These retorts, 36 in number, were put out of action in 1923, to make way for the second installation of verticals. In 1908 a carburetted water gas plant was installed, comprising two sets of Merrifield-Westcott-Pearson type; each set being capable of producing 750,000 c.ft. of C.W.G. per diem.

In 1913 a contract was placed with the Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., for a carbonizing plant of 100 tons capacity per day, consisting of twenty Woodall-Duckham vertical retorts built in settings of four. This plant has now been in operation for eleven years. It continued for eight years without being re-set, and then only partial re-setting was necessary. As the result of the success of this first plant, the Gas Committee and their Engineer and Manager, Mr. S. Milne, decided to scrap the inclined retorts, and to replace them with verticals. A contract was therefore placed, in June, 1923, for a further installation of Woodall-Duckham verticals having a capacity of 192 tons per 24 hours; and this plant was put to work at the end of November, 1924.

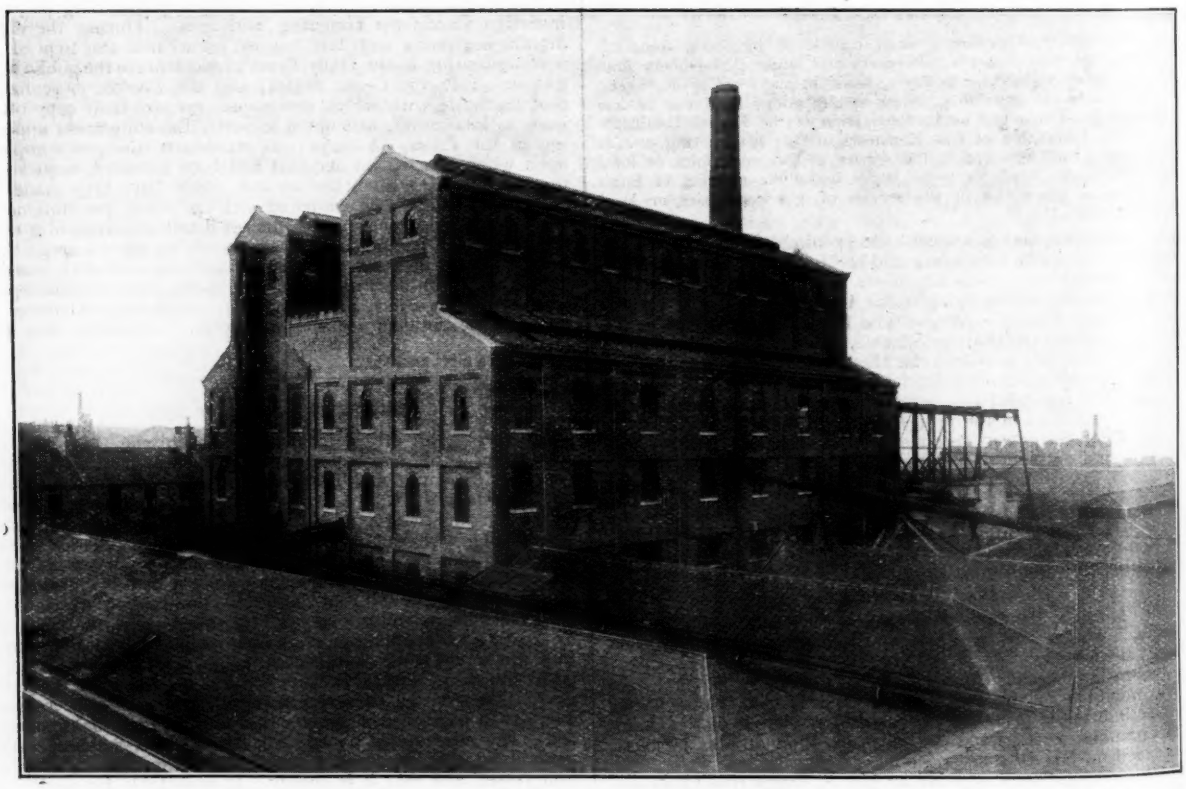
The new plant consists of twenty-four retorts built in settings of four. In comparison with the first installation, it is interesting to note that, per ton carbonized per day, there is a saving of ground space amounting to at least 25 p.ct.

A waste-heat boiler of the Woodall-Duckham fire-tube type has been provided; and when all the retorts are working at full capacity, the boiler is capable of generating 4200 lbs. of steam per hour at 100 lbs. per sq. in., from feed water at 60° Fahr. To ensure that steam used for steaming the retorts is absolutely dry, a superheater is provided in the inlet flue to the boiler, capable of raising the temperature of the steam to about 500° Fahr. In order to provide sufficient pull on the settings, an induced draught fan is provided at the outlet of the boiler, driven by a high-speed vertical steam engine. The feed water is heated by means of the exhaust steam from this engine.

OUTSTANDING FEATURES.

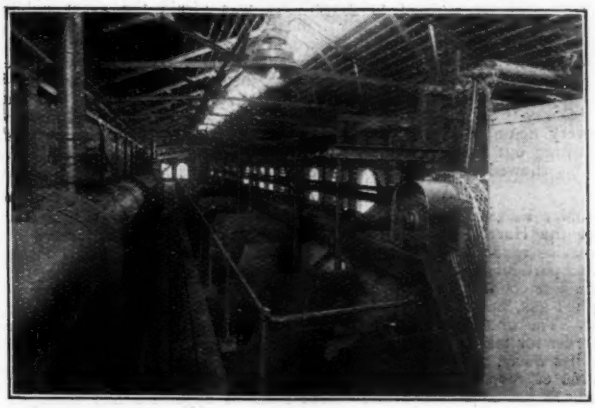
The outstanding features in connection with the new plant at Aberdeen which show the trend of improvements in vertical retort design may be summarized as follows:

1. Large units, working independently of each other, which can be regulated individually and shut down for scurfing or repairs without causing any interference with the remaining working retorts. The labour required to work the plant is the same per unit as that necessary for



WOODALL-DUCKHAM VERTICAL RETORT HOUSE.
Showing 1913 settings on left, and 1924 settings on right.

Producer Stage.



Conveying Plant.

smaller units, and thus considerably reduces the working costs.

2. The regulation of the temperatures in the combustion chambers is particularly easy, due to the ample area of all flues and the reserve capacity of the producers, and it is found possible to work the plant over long periods without making any adjustment whatever to the controlling dampers which are provided for the independent chambers of each retort.
3. The plant is worked under a very low draught; and thus infiltration of air into the waste gas flue is reduced to a negligible quantity, with the consequent saving of power for the induced draught fan of the waste-heat boiler.
4. The producers are of large capacity, and their particular feature lies in the fact that they will carry a reserve of fuel to last for 24 hours without unsealing their curtain arches.
5. The extractor gear is so silent that the Engineer has installed an indicator at the top of the setting level, so as to inform the top man should any stoppage occur to the extractor driving engine, or its stand-by motor.
6. The combustion chambers can be inspected at the top and the bottom in comfort; the sighting holes being readily accessible. Thus a complete set of temperatures can be quickly obtained.
7. The plant is particularly cool, both on the charging stage and on the damper control platform, due to the special attention that has been paid to the insulation of the outside walls on the top setting brickwork.

BRITISH COMMERCIAL GAS ASSOCIATION.

DISTRICT CONFERENCE AT HARROGATE.

A DISTRICT Conference under the auspices of the British Commercial Gas Association was held at Harrogate, on May 21; the meeting taking place at the Harlow Manor Hydro. The proceedings opened by a luncheon, at which about eighty were present. The subsequent conference was held in the delightful Winter Garden of the Hydro—fitting surroundings for discussion of the advantages of gas as a means of restoring to the public the benefits of sunlight, natural beauty, health, and cleanliness.

Mr. Francis Barber, Chairman of the Harrogate Gas Company, presided over all the proceedings of the day. At luncheon he was supported at the top table by the Mayor of Harrogate (Councillor C. E. Carter, J.P.), the Mayor of Halifax (Alderman J. H. Waddington, J.P.), the Town Clerk of Harrogate (Mr. Turner Taylor), Mr. J. H. Ellis (President of the "B.C.G.A."), Mr. A. Proctor (Chairman of the York Gas Company), Dr. R. Veitch Clark, M.A., M.B. (Medical Officer of Health for Manchester), Dr. James Mair, M.B., D.P.H. (Medical Officer of Health for Harrogate), Mr. F. H. Robinson, Assoc.M.Inst.C.E. (Engineer and General Manager of the Harrogate Gas Company, and President of the Manchester District Institution of Gas Engineers), and Mr. W. M. Mason (Manager of the "B.C.G.A.").

The first toast, following that of "The King," was to "The Prosperity of Harrogate," which was proposed by Alderman WADDINGTON in a characteristic speech, and replied to by Mr. CARTER.

PROBLEMS OF THE GAS INDUSTRY.

Mr. ALFRED PROCTOR, proposing a toast to the "B.C.G.A.," said he believed it was generally recognized to-day in the gas industry that, without the wonderful help of the Association, the industry would be much worse off. He was present at the inaugural meeting thirteen years ago, when Sir Corbet Woodall was the first President. He believed that Sir Corbet's prophecy that the "B.C.G.A." had heralded-in a new world for the gas industry had been amply fulfilled. For a long time now the trend of opinion had been in the direction of common action in the industry. The efforts of local undertakings could have little general success without the central organization of the "B.C.G.A." The question of the residuals market was very much in mind at the moment. They all knew the seriously adverse conditions of that market—conditions which had been reflected in almost every undertaking's balance-sheet for 1924. Nothing could be accomplished in this matter by local effort; but a strong central committee were considering the question, and they all hoped their work would tend in some degree to relieve the industry from the present adverse conditions. Another important subject demanding attention was the strenuous competition of the electricity industry. He believed gas was to be met by more intensive competition than ever before. The production and distribution of electricity was to be backed by the resources of the State. If the State considered it necessary to subsidize electricity, then he claimed that the gas industry should have the same treatment. The growth in consumption of gas, which was the universal experience of undertakings in 1924, was due in no small measure to the work of the "B.C.G.A." Results had shown that gas as a commodity for domestic and trade uses was growing strongly in popular favour. The industry had completed a century of gas supply. If one looked back on its history, one must be impressed by the extraordinary buoyancy and elasticity to changing conditions. The industry came to birth in a cloud of ridicule, and there had since been many crises. The competition of electricity had not extinguished the gas industry. On the contrary, it had been a great stimulus. One feature in the aims and ideals of the "B.C.G.A." which he would emphasize, and one which was consistently enlarged upon by Mr. F. W. Goodenough in his energetic work for the movement, was the ideal of public service. They must all recognize—whether municipal administrators or company controllers—that they were ministering very greatly to the daily needs and comforts of the people among whom they lived.

Mr. J. H. ELLIS, responding to the toast, said that the greatest object of the "B.C.G.A." was to publish the truth. The Association stood for clean and comfortable homes, for clean and comfortable towns, for cheapness and efficiency in industry; and he did not care what rival they had to face, provided the competition was fair. He had in his time been interested in both the electricity and the gas industries. What he said was: Let each be used where it is most economical and efficient. What they objected to was unfair competition; and they looked like getting it in the grossly unfair proposition to bolster up one industry with money wrung from the taxpayers, and at the expense of another industry. The gas industry had its exhibit at Wembley, and was appealing for support to gas undertakings, because it knew that bread cast upon the waters at Wembley would be returned a hundredfold.

PROGRESS AND PROSPERITY.

Mr. W. M. MASON, proposing a toast to the Chairman and Directors of the Harrogate Gas Company, read a telegram of greeting from Mr. F. W. Goodenough, Chairman of the Executive of the "B.C.G.A.," who wired: "To-day's 'Times,' 'Telegraph,' 'Morning Post,' and others show activity of Headquarters. Association's influence was very helpful in securing results. All good wishes." He (Mr. Mason) was sure all wished the Chairman and Directors of the Harrogate Gas Company success and prosperity. Prosperity was not merely a thing to drink to. It carried other aspects. The biggest

thing in prosperity was progress. The Harrogate Gas Company were making efficient progress. He was afraid the great public service rendered by the gas industry was often forgotten by the public who benefited from it. It would be remembered quickly enough if the service which had been enjoyed for generations, and which he was confident would be enjoyed for generations to come, was suddenly stopped. The greatest national festival in England was not the "Derby" or the football Cup Final: It was the Sunday dinner in every home in the country; at which period the gas industry was putting out more gas than at any time in the whole of the week. This showed how the public benefited by the gas industry.

An Enterprising Undertaking.

Mr. Francis Barber, replying, gave an outline of the history of the Harrogate undertaking. He suggested that the record of service rendered by the public utility undertakings of this country, and particularly the gas undertakings, would always be worthy of the highest commendation. The Harrogate Gas Company not only supplied gas, but saw to it that the consumer got the best service from it. The undertaking had now 90 miles of mains, and they had an Order for taking-over the small undertaking at Pateley Bridge, twelve miles away, and including the area of that works in the Harrogate area of supply. They had at present 10,900 consumers, using over 20,000 gas appliances; and recent sales of apparatus had averaged about 2000 a year. They had a co-partnership scheme by which the workers enjoyed a share of the profits of the undertaking; and they were hoping shortly to arrange a superannuation scheme for the benefit of the aged or incapacitated.

THE CONFERENCE.

Chairman's Outlook.

At the opening of the afternoon conference, Mr. Mason read a letter from Mr. F. W. Goodenough, Chairman of the Executive, regretting his unexpected inability to be present.

The Mayor of Harrogate gave a brief but hearty welcome to the conference, and mentioned that the gathering was one of a series of conferences which it was expected to hold at Harrogate during the present summer.

Mr. Francis Barber, in his opening remarks as Chairman of the meeting, said he was proud to give what support he could to the "B.C.G.A." It was his privilege to be present at the inaugural meeting of the Association, held in Manchester in October, 1912, under the presidency of Sir Corbet Woodall, whose name and work must always have a place in its history. The meeting left on his mind an impression of the erection of a massive structure in unity to be sustained by pillars which would not only maintain it against all attacks, but be strengthened by every attempt to shake it. He was glad to know his expectations had been fully realized. They must not forget, however, that the life and soul of the Association would always depend on the inspiration and the activities of those at its head. He wished to take the opportunity of bearing his personal testimony to those to whom they owed so much; and he hoped he was not out of place in singling out Mr. F. W. Goodenough as the very heart and inspiration of the movement, and Mr. W. M. Mason as its clever administrative head. It was a real personal disappointment to have been deprived at the eleventh hour of Mr. Goodenough's presence that day.

He believed the advantages the industry had gained by the work of the "B.C.G.A." had repaid with abundant interest the financial contributions the Association had received from the supporting undertakings; and he appealed to every concern outside the Association to make their proper contribution to the cost of the work from which they, like all others, were receiving so great a benefit. If they were called upon to fight so unjust a preference as that proposed to be given to electricity undertakings, it was necessary that the Association should be able to speak for every gas undertaking in the country, great or small.

The Electricity Subsidy.

Turning to the electric subsidy question, he must express his astonishment that a Government elected on an anti-Socialistic policy should, through the responsible Minister, have declared their adherence to so deliberate a step towards the socialization of an industry as to propose to indemnify it against loss on its development in unremunerative areas. He was surprised that Mr. Philip Snowden, the outstanding apostle of Socialism, should have found so many ready disciples in the Cabinet of the present Government. If any industry was entitled to the generous support of the Government, it was the gas industry, which in the hour of the country's peril rendered service of incalculable value. ["Hear, hear."] They could never forget the mean and contemptible acknowledgment of those services which was embodied in the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, which left the proprietors with so small a return on their invested capital. No industry which did so much in support of its country's cause suffered more. If any preference were given to the electricity industry and were not also conceded to the gas industry, it would not be "cricket;" and he thought it would outrage that spirit of fair play upon which they as Englishmen prided themselves. Mr. Barber said he had for some time been a shareholder of several electricity undertakings, but he was not aware that they had sought the assistance which the Government proposed to give them. He believed they were developing on sound lines, and would be able, by their own resources, to finance all developments likely to be remunerative in ten, fifteen, or twenty years. He did not agree that electricity could bring to the rural districts advantages at all on a par with those to be obtained from gas. The gas industry had, indeed, a much stronger case for State assistance than could ever be put forward by its competitors. He emphasized the necessity for stern opposition to the proposal to subsidize electricity at the cost of the gas industry.

A Companies' Section of the "B.C.G.A."

As Chairman of a Company undertaking, Mr. Barber said he would like the Association to consider the desirability of forming a Companies' Section. He thought this might be of great service. They had realized the benefits of close co-operation in matters generally affecting the industry, but there were many domestic matters concerning a company undertaking which did not affect municipal undertakings, on which conferences and common action by companies might be of great benefit. He would instance such matters as the raising of capital, standard dividends, rates of dividends, basic and maximum prices, assessments to local rates and taxes, precedents of Parliament in dealing with company legislation, and combined action to meet persistent demands of road boards and railway companies, for the insertion of special clauses in a Company's Act, and other matters in which they were concerned and in which the municipal undertakings were not.

LIGHT AND HEALTH.

Dr. R. Veitch Clark, M.A., M.B., Medical Officer of Health for Manchester, gave an extempore address, with the aid of charts, entitled "Light and Health," in the course of which he dwelt on the importance of sunlight to human health and prosperity, and the enormous influence of the smoke-pall, caused by burning raw coal, in creating disease and depriving people of the benefits of sunlight. Everybody who lived and worked in an industrial community, he said, was well aware of the intense gloom that settled over towns even in the summer months. He had noticed it himself in Manchester only the previous day. He was not at that conference as one having any interest in the gas industry, but as one who hated the coal chimney. To think that a black fog could settle on the town in May, in this age of science and civilization, was an absolute disgrace. Anything that would help to sweep away the intensely depressing conditions of industrial life was a thing to be encouraged by everybody in authority; and this was why he supported the gas industry. The speaker described the nature of the filth and products breathed by people in a smoky atmosphere, and the effect on the lungs and on health. These things of themselves undoubtedly hastened death, but even more important, probably was the fact that the smoke shut out the beneficent sunlight and the invaluable ultra-violet rays, the nature of which he proceeded to describe. Ages ago people worshipped the sun because they realized that it was the source of all life and health; and yet in these days of civilization we shut out the sun by our own folly. We went away from town to holiday places to get the sun which we could get at home if we did not burn raw coal. The speaker described sunshine treatment for tuberculosis and other disease in Switzerland, and at a sunshine sanatorium under his own charge in North Wales, and spoke of remarkable cures without the aid of medicine or surgery. He said he would urge the application of any kind of power or authority that would compel the minimization of smoke.

GAS AS A PUBLIC SERVICE.

By Frank H. Robinson, Assoc.M.Inst.C.E.

Few people realize the extent to which gas enters into public life; most think only of its domestic uses for lighting, heating, and cooking, without realizing the extent to which gas and its bye-products enter into the manufacturing and business life of the country.

To dwell for a moment on the domestic aspect of the use of gas, it is interesting to know that to-day there are over 8½ million consumers in Great Britain and Ireland, and that more than half this number are supplied with gas through the prepayment meter. It is no exaggeration, therefore, to say that gas is giving service in some form or other, for cooking, heating, lighting, or hot water supply, in practically every home in the land. Another interesting point in this connection is that the greatest demand for gas throughout the country at any given time occurs between the hours of 11 and 1 o'clock on Sundays, when the millions of gas cookers are in use for preparing the Sunday dinner. This is a national festival that overshadows in importance the Derby or the Boat Race.

To turn to the use of gas in the industrial sphere, if I were to attempt to describe the variety of purposes for which gas is employed in the manufacture of practically every known want of man, I would need to write a treatise, as there are over 3000 known processes in which gas plays an important part. I propose, therefore, to deal only with the use of gas in a resort like Harrogate; but, before proceeding to this particular subject, there are one or two points with which I would like to deal briefly.

The scientific carbonization of coal on the gas-works is a

potent factor in the all-important question of the conservation of that national asset coal; and it is well that the public should realize that, in extracting the heat units from the coal and supplying them for the needs of the community in the form of gaseous fuel, all the valuable bye-products are recovered. They are wasted when coal is burned in its raw state.

Another point on which I should like to comment is the enormous magnitude of the gas industry. We see in some of the newspapers to-day fantastic claims and ideas with regard to the use of electricity being the "panacea for all ills." While we all recognize that electricity has its proper place in service to the community, we must view it in proper proportion, and not be misled by statements which are, to say the least, fantastic. The Governor of the largest gas company in the world, in a recent speech, made the statement that the total heat units supplied by that one Company alone to its consumers was greater than the energy supplied to this country by the whole electrical industry. When I tell you that that Gas Company's output represents between 12 and 13 p.ct. of the total output of the whole industry, you get some conception of the relative magnitude of the service which the gas and electrical industries are providing for the community generally. After well over a century of service to the public, the gas industry continues to progress, and is a much more lively and virile body than some of its competitors would have the public believe.

The hygienic aspect of the use of gas in the home is a subject of considerable interest and importance, and it is gratifying alike to the industry and, I suggest, to the general public that the claims made by the gas supply industry as to the many advantages of gas from a health point of view are supported and confirmed by the great bulk of the medical profession, who are big users of gas in their own homes and consulting rooms. It is a fact that, of the London residential districts, the Harley Street area, which houses the leading men in the medical profession, shows the largest consumption per acre. Similarly gas is very extensively used in a large number of hospitals, both in London and throughout the country.

Besides being noted as a spa, Harrogate has a wide reputation for a very pure atmosphere. The use of gas and coke has contributed very largely to the beautiful clear air of the town. Imagine for a moment what conditions would be like in Harrogate if the 11,000 gas consumers were to use only coal for their cooking and heating—every kitchen chimney belching forth smoke; every hotel, hydro, and boarding establishment doing the same; a procession of coal carts to these places; and the resultant procession of dust carts removing ashes every morning; black dust mixed with brown dust, soot and grime in the bedrooms, and over the town a pall of smoke. This would not attract people to Harrogate to take the "cure" or spend their holidays. It would also mean more traffic in the streets, more labour in handling refuse, and consequently higher rates, and larger staffs in the hotels and hydros. Altogether, apart from the effect upon the health of the inhabitants, the picture would not be good to look upon. I do not propose to touch on this side of the question, as it has been already dealt with in a most capable manner by Dr. Veitch Clark, the Medical Officer of my native city.

In Harrogate, there is scarcely a boarding-establishment, apartment-house, hotel, or hydro without gas for cooking purposes. This is a sufficient testimonial to the convenience, economy, and cleanliness of gas for this work. The gas cooker is always ready for use; there is no waiting for the fire to burn up; and no necessity to get up an hour earlier to provide breakfast for the visitor who wishes to catch an early train. Breakfast can be prepared at a few minutes' notice, and the cooker turned out when the meal is ready, and left out of use till it is time to prepare for lunch; and thus the kitchen does not become insufferably hot, as it would if a coal fire were used.

In the bathroom a gas geyser is most useful to the visitor in an apartment-house who desires to have a hot bath at any time, without having to give special notice to the landlady to have the water hot. In the larger boarding establishments the gas circulator or the coke-fired boiler is more suitable, providing, as it does, hot water at all times, and also a means of consuming, along with the coke, the combustible refuse which accumulates in such establishments.

There are many of the larger hotels and hydros in Harrogate with very complete equipments for heating and cooking by gas and coke, notably the Cairn Hydro, the George Hotel, the Harrogate Hydro, the Queen Hotel, and the Adelphi Hotel; but there are still proprietors who have not yet realized to the full the great advantages of gas for all purposes in the kitchen, still-room, or elsewhere.

The Cairn Hydro kitchen is fitted with a large gas roasting oven, three double gas ovens with hotplates, two large hotplates and boiling tables, one with ten and the other with six gas rings, a stand for two stockpots, also two vegetable steamers and a hot closet heated by steam derived from a boiler fired by coke. The still-room contains a gas-heated toaster, a hotplate, and two steam kettles. In the kitchen no solid fuel is used. This establishment caters for 300 guests. The general heating is done by radiators supplied from a coke-fired boiler. The gas undertaking therefore supplies all the heat for the feeding and warming of the 300 guests and the staff in this large establishment. It is therefore very much a public servant, and is always on duty.

The George Hotel, close to the Cairn Hydro, also has a very complete gas equipment. In the kitchen there are: A gas cooker with four ovens and hotplate; a gas cooking range, fitted into a recess formerly occupied by coal-fired ovens, comprising two pastry ovens and a large hotplate, mostly constructed by the Gas Company; a gas roasting oven; stock-pot stand made by the Company; a steam-heated bain-marie; a steam vegetable oven; a gas griller mounted on a gas oven. In the serving room there is a long steam-heated hot-closet and a Jackson boiler; while the still-room contains two gas-heated coffee urns, a six-burner boiling-table, and a large toaster. This hotel caters for about 130 to 150 guests. All the steam required is raised in a coke-fired boiler.

The Adelphi Hotel is another which has all-gas equipment. In the kitchen there are: A hotplate 6 ft. long, a toaster, a large double roasting oven, a single oven, and a stockpot stand. In the still-room and serving room there are: A Jackson boiler, two toasters, a hotplate, a 5-gallon boiler, and a large hot closet. All the above are gas-heated appliances. General heating is done by radiators from a coke-fired boiler.

The examples given above are only three among many, and are detailed to show how much the public are served by gas and coke in a health resort.

There is one advantage attached to the use of gas appliances in large kitchens which is sometimes overlooked—viz., the ease with which the place can be kept clean, particularly about the floor. Smoke and soot are absent, and the appliances can be placed upon stands, leaving a clear space beneath to permit of the floor being swept and washed. Also a re-arrangement of the appliances is easily obtained, if desired, without structural alterations, and additional appliances can be installed with nothing more than a pipe and perhaps a short length of flue. This cannot be done with coal-fired apparatus.

To give some idea of the extent to which gas can be applied

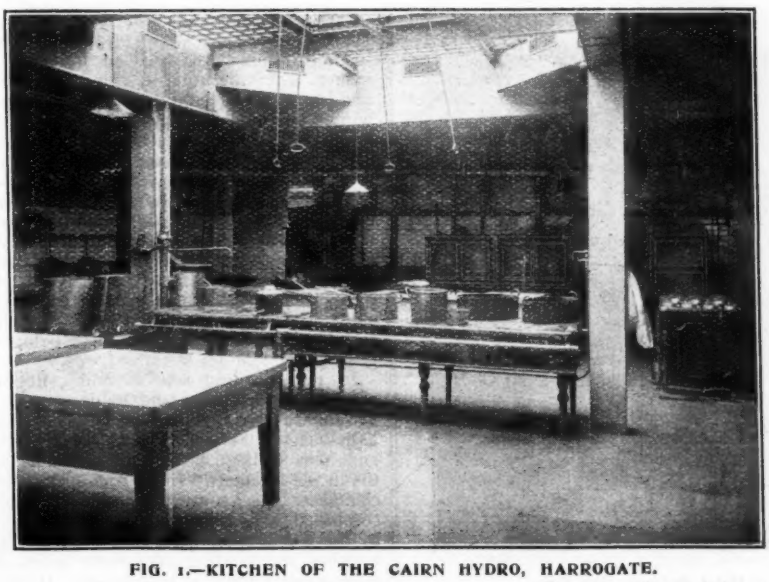


FIG. 1.—KITCHEN OF THE CAIRN HYDRO, HARROGATE.

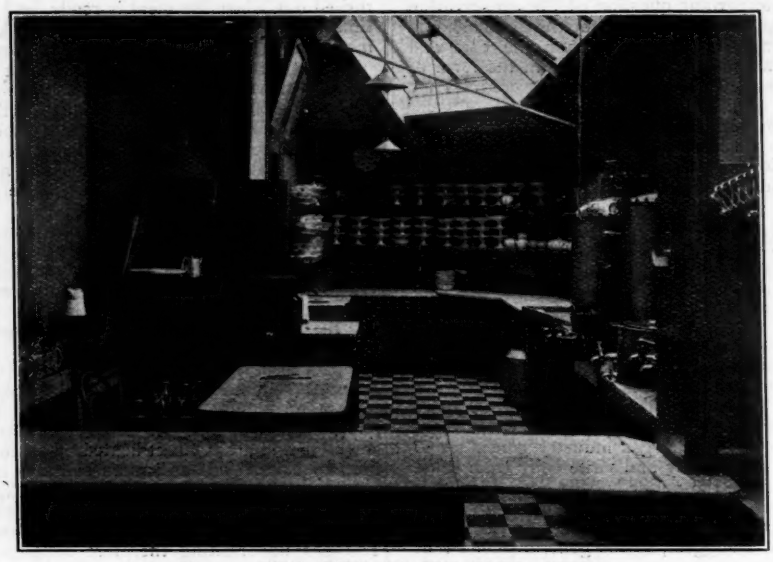


FIG. 2.—STILL-ROOM OF THE CAIRN HYDRO.

in catering for the needs of the public in seaside and health resorts, I have prepared the following list, which should not, however, be taken as exhaustive.

Cooking.—Gas roasting ovens, pastry ovens, hotplates, stockpot stands, vegetable steamers, grillers, pudding boilers, &c., bain-maries, fish fryers, &c.

Still-Room.—Gas boilers for hot water, coffee boilers, toasters, hot closet for keeping plates and dishes warm, &c.

Bathrooms.—Gas geysers, heated towel rails, circulators.

Corridors.—Gas radiators, or hot water radiators supplied from coke-fired boilers.

Bedrooms.—Gas fires with shilling prepayment meters.

Lounges, Drawing Rooms, &c.—Gas fires and radiators.

Garages.—Safety gas radiators.

For many years the bedroom fire has been a source of trouble and expense to both visitor and management. In the early spring or late autumn a fire in the bedroom is a boon. People coming to Harrogate for treatment at such times, and more so in the winter, find a bedroom fire not only a necessity but a comfort. They are often deterred from having one by the charges made for a coal fire and the nuisance of members of the staff having to attend to it, while the management of the hotel dislike having to light a fire with the consequent handling of coal, ashes, &c., and the extra labour involved. The result is that people avoid going away at these times, and the hotels lose business.

The gas fire with a prepayment meter attached overcomes these difficulties and provides the visitor with comforts such as he or she is accustomed to at home. The fire can be lighted when desired, to take away the chill of the room during (say) dressing for dinner or retiring for the night. In case the visitor is suffering from any complaint requiring warmth, the gas fire is available continuously or intermittently. To make a visitor comfortable is to attract custom, for each satisfied visitor is a missionary.

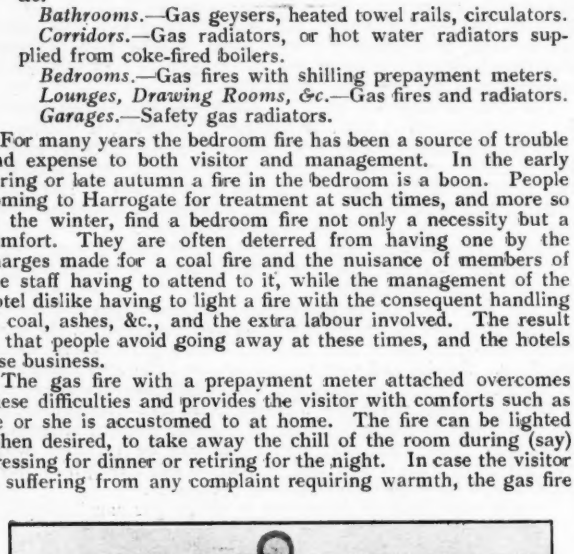


Fig. 3.—Typical Hotel Bedroom Gas Fire.

It must not be thought that the visitor gets all the benefit. It is a paying proposition to the management, apart from the attraction which it proves. The whole gas supply to the hotel or hydro passes through the main meter, and the establishment is charged at the usual price, subject to special discounts for large consumptions. The slot meters attached to the fires are set to give such a quantity of gas for a shilling as will cover the rent of the meter, if any, and leave a margin to pay interest on the capital cost of fire and piping. Take the following case with the costs given:

Gas (460 B.Th.U.) at 9d. a therm (gross) less 10 p.ct. discount			8·1d. net.
Gas fire, with piping, average cost	£5	15	0
Hire of extra meter, 1s. a quarter = 4s. a year	0	4	0

Slot meter set at 216 c.ft. a shilling = 4s. 7½d. per 1000 c.ft. net, or 1s. a therm net.

If we assume the fire to be used only two hours a day for 150 days in the year, some 10,500 c.ft., or 48 therms, would be used in the average bedroom, costing the visitors about 2d. an hour. In other words, the visitor would have the benefit of a fire for dressing, morning and night, for a whole week for two shillings, which is much less than the cost of coal fires for that period.

The cash put into the meter in the year would be £2 8s. This amount could be collected by the gas inspectors, and credited to the gas account of the hotel, or by the hotel management, as may be arranged. The costs would then work out as follows:

	£	s.	d.
48 therms at 8·1d. net	1	12	5
One year's rent of slot meter	0	4	0
	£1	16	5
Received from slot meter	2	8	0
Annual profit to hotel proprietor, per fire = 10 p.ct. on capital expenditure.	0	11	7

These figures are based on the actual costs and prices in the case of a private hotel in Harrogate with seven such gas fires, and show the benefit to be obtained even where there is no winter season. The proposal is even more attractive to both visitor and hotel proprietor in places such as Bournemouth, Torquay, Hastings, Eastbourne, &c., where there is a winter season. The service given by gas to the public in such resorts is not limited to the hotels and hydros, &c. The bread and confectionery supplied to the tables is baked in gas and coke heated ovens at the local bakehouses. When the visitors take a stroll in the town or the gardens, and have afternoon tea, gas is again their servant in providing tea, toast, &c. Again, when they go to the theatre or concert hall, and the night is chilly, heat from the radiators is available to make them comfortable; the source of that heat being coke, a product of the gas-works.

In the boarding schools and colleges, of which there are many in Harrogate, the equipment in the kitchens is very similar to that of the hotels. The Ladies' College, Queen Ethelburga's School, Pannal Ash College, Ashville College, and New College have a considerable amount of gas apparatus in the kitchens. In all such places the use of gas makes for cleanliness, economy, convenience, and reduction of labour, combined with absolute reliability, which cannot be obtained by the use of coal. The regulation of the heats for the various cooking and heating operations is more easily obtained; and consequently there is less waste. If no such benefit had been

obtained, the use of gas for these purposes would not have extended at the rate it has done.

Before the commencement of the holiday season, the appliances at most places are examined, repaired, and adjusted by us. Likewise, the schools and colleges have their apparatus overhauled before the commencement of each term. In addition, the Company's gasfitters are available at any time for keeping all appliances working at full efficiency. Too often it occurs that results are spoiled through proprietors not taking the trouble to acquaint the Gas Company of their difficulty, though the Company have expert advice and assistance at free disposal. No charge is made either for advice or for the regulating of apparatus, but only for repairs, cleaning, and overhauling. If such proprietors would realize that it is economical to have regular inspection, and keep their appliances in good repair, they would be doing themselves, their customers the visitors, and the Gas Company a service.

Many people talk glibly about gas being done for; but they do not appreciate how much they are dependent on the gas undertaking, especially when they go away from home. The foregoing will, I hope, serve to make the people realize how much gas is a public service. There is plenty of room for further use of this service. Some who cater for the public needs have found its value, but there are many others who have not yet completed their education.

Discussion.

Dr. JAMES MAIR said that Dr. Veitch Clark had put the subject in so lucid a manner that little was left to add. He certainly agreed entirely with what had been said. Recently he had read a book entitled "The Smokeless City," by Mr. Simon, formerly Lord Mayor of Manchester, who took Manchester as the type of smoky city and Harrogate as the smokeless town. In Harrogate, it was true, the nuisance from industrial smoke was practically non-existent, but there was the smoke from houses. The domestic smoke in Harrogate did not, perhaps, shut out the ordinary sunlight, as did industrial smoke, but it did cut off the ultra-violet rays which were so valuable. He would be interested to have the views of Dr. Clark or any other authority as to the best means that could be taken to prevent this pollution of the atmosphere by smoke. In many industrial towns they had legislative powers which to some extent dealt with industrial smoke, which, he believed, was being reduced; but there was no power to prevent house smoke. They must make the public realize the evil of this smoke.

Mr. ELLIS said the question of coal conservation had recently been raised in Parliament by Lady Astor, who suggested that the legislature should do something further. By all means do everything possible by legislation, said Mr. Ellis; but he had far greater faith in publicity of such important and vital scientific facts as Dr. Veitch Clark had given to the meeting. This was what the "B.C.G.A." were out to do.

Councillor DAY (Halifax) said he was entirely in agreement with the views expressed by Dr. Veitch Clark. In Halifax they were trying to do their part to recover the benefits of sunshine.

Mr. MALLINSON, Proprietor of a Harrogate hotel, said his was the hotel to which Mr. Robinson had referred in mentioning an installation of gas fires in bedrooms. He had four installed, and was so satisfied that he got another five, and now he had received bookings from visitors specifying the bedrooms in which were gas fires. He found also that the fires saved him at least one servant.

The MAYOR OF HALIFAX said he had been Chairman of the Gas Committee there for many years, and in Corporation houses now they were making no provision for the burning of raw coal in bedrooms. If public representatives would take up the great question of the smoke evil, and apply their convictions to the prevention of coal fires in bedrooms, they would achieve a great deal.

Dr. CLARK and Mr. ROBINSON briefly replied.

On the motion of Mr. MASON, thanks were tendered the Chairman and all who had contributed to the success of the meeting.

New Holder at Marsden.—Messrs. Firth, Blakeley, & Co., of Church Fenton, have just completed for the Marsden (near Huddersfield) Urban District Council a new gasholder of 200,000 c.ft. capacity. The holder stands on Council land adjoining the gasworks.

Price of Gas at Arbroath.—The Arbroath Town Council have been assured by Mr. John Souttar (the Convener of the Gas Committee) that there is no prospect of an increase in the price of gas. Contracts have been entered into for 11,500 tons of coal, at a price of about 5s. 7½d. per ton less than last year.

Smethwick Gas Undertaking.—In his annual report for the year ended March 31, Mr. Ernest Hardiker, Engineer and Manager, records an increase in the consumption of gas of over 94 million c.ft., equal to 12·83 p.ct. The use of gas for industrial purposes, he mentions, has risen from 84 million c.ft. in 1910, to 366 millions during the past year. This is equal to 45·91 p.ct. of the total quantity sold. Mr. Sidney Taylor, Borough Treasurer, states that the gross profit for the year was £29,538, and the net profit £10,196.

Meters, Ltd.—The report to be submitted at the meeting in Manchester next Wednesday (June 10) states that the accounts for the year ended March 31, with the balance brought forward, show a total sum of £26,876; and after deducting interim dividends, there is a balance available for appropriation of £20,204. The Directors recommend the payment of final dividends of 2¾ p.ct. (actual) upon the preference shares, and of 6 p.ct. (actual) upon the ordinary shares—making the total dividends for the year 5½ p.ct. on the preference shares and 8½ p.ct. on the ordinary shares, both less income-tax. This will leave to be carried forward a balance of £7812, subject to corporation profits tax.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Subsidizing Electricity.

SIR,—There is more than one way of killing a cat!

I am to an extent in sympathy with Mr. Milne Watson's attitude in regard to the proposed subsidizing of the electric undertakings by the Government. At the same time, I realize that there is a far better way of meeting this matter than by crying over it. The gas industry is blessed with an Act of Parliament that allows all qualities of gas to be distributed; and it would be a fairly good answer to the gas industry's cry if the Government said: "We are subsidizing electricity to make competition with you keener, and to cause you to look to the methods you adopt."

I have maintained for some years that coke production is fatal to the gas industry's interests. On the other hand, the leaders of the gas industry claim that coke-making is essentially an integral part of the process of town gas production. I join issue with these leaders, and ask them to declare frankly what the costs of coke production are.

Let the proposition be examined in the light of the following questions:

(1) Why does the gas industry favour the production of a rich gas and a make of 70 therms per ton, with coke?

(2) Why does the industry not produce (say) 170 therms and no coke?

If any gas undertaking's accounts be examined by an unprejudiced accountant, it will be found that coke production costs at least as much as is obtained for it outside the cost of the coal from which it is obtained. For example: 13 cwt. of coke are produced per ton of coal. It requires no effort to realize the 13/20ths of the manufacturing plant is provided and used for the manufacture of coke.

	Per Ton of Coal Carbonized.					
	s.	d.	£	s.	d.	
Cost of coal . . .			1	13	2	
Repairs and maintenance of works . .	15	4				
Wages, carbonizing .	3	2				
Capital charges, including profit . .	14	8				
			1	13	2	
			£3	6	4	

	s.	d.	£	s.	d.
Cost of coal due to coke production, 13-20ths of £1 13s. 2d. . . .			1	1	6
Proportion of repairs and maintenance of works due to coke production, 13-20ths of 15s. 4d.	10	0			
Do. wages, carbonizing, 13-20ths of 3s. 2d.	2	1			
Do. capital charges and profit, 13-20ths of 14s. 8d. . . .	9	6			
			1	1	7
			£2	3	1

The sale of coke per ton of coal realizes 16s. 4d.

These figures, taken from actual accounts, show that the cost of coke per ton of coal carbonized is £2 3s. 1d. If £1 1s. 6d. be deducted, the amount left is £1 1s. 7d., and yet the coke is sold for 16s. 4d.—a dead loss, outside the cost of the coal, of 5s. 3d.

The total loss on coke production is £2 3s. 1d., *less* 16s. 4d.—that is, £1 6s. 9d. per ton of coal carbonized, and this without reckoning the office or other standing charges for the production and salesmanship of coke.

Do not let us imagine, therefore, that coke production is a profitable part of our business. Is it absolutely essential to produce coke? If so, little or nothing can be said. But is it? GEORGE HELPS.

Nuneaton, May 25, 1925.

Heating Bath Water by Electricity.

SIR,—On more than one occasion we have crossed swords on matters relating to electricity supply, and I think our discussions have been conducted without acrimony on either side. Your comments in "Electricity Supply Memoranda" dated May 27 on Poplar Baths calls for a reply from me regarding the cost of supply of electricity for heating bathing water.

I am not at all surprised at your comments, because, prior to giving consideration to this form of heat supply, I was of a similar opinion to yourself, as was possibly every engineer in the country. You know, however, the old adage "fools rush in where angels fear to tread"; hence, I suppose, your reference to the "real live" Electrical Engineer of Poplar.

You assert that the electric heating of water is an "impudent stunt," and that it is not cheaper than gas. The circumstances of the case are as follows:

When these baths were instituted, the Poplar Baths Committee applied to the Gas Company for a supply on trade terms—viz., 35 p.ct. off ordinary standard price, which the Company refused to grant. I found that it would pay my Committee to supply at equivalent prices, and it was decided to instal a small heating outfit at our Wick Lane establishment. Immediately the Gas Company became aware of our intention, they agreed to the factory terms, which rendered the proposition before me totally different. However, I was convinced that this problem had opened-up enormous possibilities for the outlet of electrical energy, and I recommended my Committee to agree to supply at average fuel cost only. I gather from your remarks that this is what you object to. The present cost of electricity is now less per bath than gas at current rates, and the saving effected in maintenance is all to the good.

You are perfectly aware from the information given in the "Memo-

randa" relating to off-peak periods that this sort of supply is a bye-product, and must be regarded as such. In your own industry bye-products are worth exactly what they will fetch in the market. You cannot shut your eyes to this fact, as all the important gas companies have recently raised their charges by 10 p.ct. on account of the drop in value of their bye-products.

Your quarrel with me seems to be that I ought to overlook the cost of supply with charges that are not incurred in giving this particular supply, which does not incur "distribution, capital, and other charges."

You are entirely wrong in assuming that the actual cost of production is greater during off-peak periods than at other times. Stand-by costs are higher; but these, again, do not apply to this class of load, as they would have to be incurred whether we were supplying baths or not.

The actual figures are 2¼ lb. coal per unit without stand-by; cost of coal 0·1d. per lb. Therefore cost per unit is 0·25d., *plus* conversion and distribution 20 p.ct., actual cost 0·3d.; but we are charging at the "average" cost of fuel, which is 50 p.ct. greater.

Now in your case the supply is not a bye-product, and probably with 35 p.ct. off your selling price there is not much margin for profit. I do not suppose for one moment that the "Gas Company are such asses as to supply gaseous energy at bare net fuel cost;" but there is no comparison between gaseous energy and electrical energy, and the inference which you evidently intend to convey that my Committee is comprised of "such asses" loses its point.

I think you will agree with me that the only thing that matters in connection with the supply of any commodity is the price at which such commodity can be supplied.

The irony of the matter is that I should never have been called upon to consider the question if the Gas Company had been reasonable at the outset, and had allowed factory terms. When developments have reached the point of justification, it is the gas industry that "squeals."

Now let me tell you something which may interest you more than the "queer things done in Poplar."

You are aware that a 30 p.ct. load factor is good for an industrial electricity supply undertaking. You will realize that an average of 70 p.ct. of plant and mains is practically idle all the year round. When it is generally recognized that certain supplies can be given at an average fuel cost with profit to any undertaking, I venture to predict that the gas industry will find the electricity industry a healthy competitor in water heating.

Another "queer thing" that Poplar is doing is to erect a power station that will utilize waste products of collieries. In many cases products that are now waste have a calorific value of 10,000 B.Th.U. and over. Energy will be generated from about 1¾ lb. of this waste, and the price will be certainly not less than 33⅓ p.ct. of present coal prices; therefore the cost per unit, allowing for conversion and distribution, will not exceed 0·15d.

The "real live" Electrical Engineer of Poplar cannot afford to rule out fuel costs altogether, but these costs will be so small, and the field of supply so vast, that the Gas Company will feel sorry that they brought about competition of this sort.

In this instance, there will be no "scandalous misuse of coal," as no "coal" is required; therefore the outcry of "extravagant heat expenditure" will prove of little avail to the gas industry.

I am sending your paper to Mr. Jefferson Hope, who may think it worth while to reply to the second and third paragraphs of your "Memoranda;" but I would just like to mention that the cost quoted by you, 0·517d. in September, 1923, has now fallen to 0·448d. in March last, with every prospect of a steady decrease until the new station is in working operation.

I. HORACE BOWDEN,
General Manager and Chief Engineer.

Electricity Works, Glaucus Street, Bromley-by-Bow, E. 3,
May 29, 1925.

[This letter arrived during the Whitsun holiday absence of the writer of "Electricity Supply Memoranda;" but we will not delay its publication.—ED. "G.J."]

REGISTER OF PATENTS.

Non-Atmospheric Gas Burners.—No. 211,473.

BAKHUIZEN, W., of Potsdam.

No. 3596; Feb. 12, 1924. Convention date: Feb. 13, 1923.

The patentee claims: A non-atmospheric burner of the kind in which the burner head is provided with converging nozzles or jets arranged in pairs or in groups, distinctive by the axes of the nozzles of each pair or group being disposed at an inclination to one another constituting an extremely acute angle—for example, 10°—so that the flames unite or touch each other in a manner lengthening or pulling them out distinctive from broadening. The pairs or groups of nozzles are arranged in circles one above another in the wall of the burner head, or concentrically in the top of the burner head, which has vertical, horizontal, or oblique depressions or grooves cut in it.

Wash Boilers.—No. 232,694.

SUGG, W., & Co., LTD., and SUGG, P. H., both of Chapter Street, S.W. 1.

No. 2071; Jan. 25, 1924.

This invention seeks to prevent condensed water containing iron oxide finding its way back into a wash boiler, and splashings running down to the gas burner.

The outer casing is provided with an out-turned flange having an annular groove engaged by a corresponding bead on the out-turned flange of the inner pan. A ring of asbestos or other suitable material is inserted in the groove.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Kilmarnock Gas and Water Provisional Order Bill: Brought from the Commons, read the first time, and deemed to have been read the second time and reported from the Committee.

Stockton-on-Tees Corporation Bill: Read the second time, and committed.

Gas Light and Coke Company Bill: Reported, with amendments.

Blackpool Improvement Bill and Oldham Corporation Bill: Read the third time, passed, and sent to the Commons.

South Metropolitan Gas Bill: Brought from the Commons, read the first time, and referred to the Examiners.

Mansfield Corporation Bill: Reported from the Select Committee, with amendments.

Forfar Gas Order Confirmation Bill: The Royal Assent reported.

HOUSE OF COMMONS.

Progress of Bills.

South Metropolitan Gas Bill: Read the third time, and passed.

Gas Regulation Act.

Copies were presented of the drafts of Special Orders proposed to be made by the Board of Trade under section 10 of the Act, on the applications of the Preston Gas Company, the Harrogate Gas Company, and the Hastings and St. Leonards Gas Company.

On the motion of Sir Burton Chadwick, the draft Special Orders relating to the Trowbridge undertaking of the British Gas Light Company, and the Haverfordwest Corporation were approved.

GAS LIGHT AND COKE COMPANY'S BILL.

The Unopposed Committee of the House of Lords (presided over by the Lord Chairman, the Earl of Donoughmore), on Tuesday, May 26, ordered this Bill to be reported for the third reading. There have been no amendments, other than matters of drafting, since the Bill left the House of Commons. (The provisions of the Bill, and the proceedings in the House of Commons, were dealt with in the "JOURNAL" for Jan. 7, p. 30, and April 1, pp. 29 and 61.)

MANSFIELD CORPORATION BILL.

This general provisions Bill has been before a Committee of the House of Lords for some days, and has now been ordered to be reported for third reading. Originally, it contained a clause relating to the gas undertaking of the Corporation, relieving the Corporation of the obligation to supply gas for other than lighting and domestic purposes from any main the capacity of which is insufficient. This clause has been the subject of objection by the railway companies for a long period; and prolonged negotiations have been taking place between the National Gas Council and the railway companies, with a view to arriving at an agreement as to the form which the clause should take. Agreement has at last been reached, and, in consequence, the clause in its original form in the Mansfield Bill has been deleted, and the agreed clause substituted.

The original clause in the Mansfield Bill was as follows:

> "Notwithstanding anything in any enactment to the contrary, the Corporation shall not be obliged to give from any main a supply of gas for any purpose other than lighting or domestic use in any case where the capacity of such main is insufficient for such purpose, or if, and so long as, any such supply would, in the opinion of the Corporation, interfere with the sufficiency of the gas required to be supplied by means of such main for lighting or domestic purposes."

Prior to the agreement which has now been reached, there have been attempts on the part of the railway companies to have the matter fought out in Parliament; and for this purpose they have opposed various Bills containing the clause in the above form. In most cases, however, the promoters have withdrawn the clause. The railway companies have also lodged objections to the clause when it has been included in Special Orders which the Board of Trade have been asked to make in favour of various gas undertakings; and it had more or less become the practice for the promoters of these Orders to delete the offending clause, pending the agreement which it was hoped would result from the negotiations taking place between the railway companies and the National Gas Council, and to insert the agreed clause in its place. A number of Orders were granted, however, before agreement was reached, and these did not contain any clause dealing with the matter.

Subsequently, an Order was promoted by the Pinner Gas Company in connection with which this matter was raised; and when inquiry into the granting of the Order was held at the Board of Trade, the Company intimated their resolve to have the matter referred to a Parliamentary Committee for decision. [Proceedings at the Board of Trade in connection with the Pinner Order were reported in the "JOURNAL" for June 18, 1924. p. 582.] The matter was subsequently referred to a Committee of the House of Commons (see "JOURNAL" for Aug. 6, 1924, p. 524), and the result of the discussion there was that the matter was postponed until the Autumn Session of Parliament, with a view to the parties arriving at some form of words to meet the difficulty. The clause in the Pinner Order was practically the same as in the present Mansfield Bill. A previous case in which this matter was referred to a Parliamentary Committee was that of the Special Order of the Marple Urban District

Council (see "JOURNAL" for April 9, 1924, p. 123), but in that case the clause was withdrawn because the Urban District Council were not in a financial position to fight the railway companies in Parliament.

THE AGREED CLAUSE.

The agreed clause which has been inserted in the Mansfield Bill, and which has also been inserted in the Board of Trade Order to the Pinner Gas Company is as follows:

Unless at the date of the demand for any such new or increased supply of gas as is hereinafter referred to the capacity of the distribution works of the Corporation is, in the opinion of an arbitrator, appointed as hereinafter provided, insufficient to meet (with a reasonable margin) the requirements (as existing immediately before that date) of the consumers in the portion of the area of supply of the Corporation for which such works have been provided (so far as such requirements could reasonably have been foreseen), the Corporation, notwithstanding anything contained in any other enactment, shall not be obliged to give for any purpose other than lighting or domestic use—

(a) A new supply of gas for the premises of any person demanding such supply at any time after the passing of this Act; or

(b) an increased supply of gas (other than an increased supply necessitated by any reduction of the declared calorific value of the gas);

where the giving of such new or increased supply would render necessary the laying of a new main or the making (as an alternative to the laying of a new main) of any enlargement or alteration of, or addition to, the distribution works of the Corporation. Provided that the foregoing provisions of this section shall not apply in any case in which the person demanding the new or increased supply (in this section referred to as "the applicant") shall enter into a written contract with the Corporation—

(i) To receive and pay for a supply of gas of such minimum quantity and for such minimum period as the Corporation may reasonably require; or

(ii) to make such payment or payments to the Corporation (in addition to any payments to be made from time to time for gas supplied to the applicant) as the Corporation may reasonably require;

(according as the Corporation may in their discretion determine) in consideration of, or by way of contribution towards, the expenses to be incurred by the Corporation in laying such new main or making such enlargement, alteration, or addition as aforesaid, and shall give such security for the payment of all moneys which may become due under the contract as the Corporation may reasonably demand. Provided also that, if any question shall arise under the provisions of this section between the Corporation and the applicant as to the sufficiency of the distribution works of the Corporation, or as to whether such new or increased supply would necessitate the laying of a new main or the making of any such enlargement, alteration, or addition as aforesaid, or as to the reasonableness of the minimum quantity or period or of the payments (in addition to payments for gas supplied) required by the Corporation, or as to the nature or amount of the security demanded by the Corporation, such question shall be referred to and determined by an arbitrator to be appointed (failing agreement between the Corporation and the applicant) by the Board of Trade on the application of either party after notice in writing to the other of them; and the decision of such arbitrator shall be final and binding. Provided also that, in determining any such question as aforesaid, the arbitrator shall have regard to the following, among other, considerations (that is to say):

(A) The total annual quantity of gas required by the applicant, the maximum quantity required per hour, and the hours of the day during which the Corporation may be called upon to supply gas to the applicant.

(B) The capital expenditure which the Corporation would have to incur in the laying of a new main or the making of any enlargement or alteration of, or addition to, their distribution works as aforesaid in connection with the giving of such new or increased supply.

(c) How far such capital expenditure may become unproductive to the Corporation in the event of the cesser of the new or increased supply.

Subject as aforesaid, the provisions of the Arbitration Act, 1889, shall apply to any arbitration under this section.

BARROW-IN-FURNESS CORPORATION BILL.

This Bill (see "JOURNAL" for Jan. 21, p. 142, and April 15, p. 187), which contains a number of clauses of a general character relating to the Corporation's gas undertaking, was ordered by the Unopposed Committee of the House of Lords (presided over by the Lord Chairman, the Earl of Donoughmore), on Tuesday, May 26, to be reported for third reading. There are no substantial changes in the gas clauses since the Bill left the House of Commons.

NEW SHOREHAM HARBOUR BILL

The Unopposed Committee of the House of Commons, presided over by Mr. JAMES F. HOPE (Chairman of Ways and Means), on Tuesday, May 19, ordered this Bill to be reported for third reading. Its purpose is to enable the Harbour Trustees to continue for a further period to increase their statutory maximum rates and charges by 100 p.ct., and to purchase land for the development of the harbour. There was originally a petition against the Bill by the Brighton and Hove General Gas Company, whose coal is discharged in the harbour, but the petition was withdrawn as the result of agreement being reached. The Gas Company objected to the Trustees having power to acquire part of their lands, and to the extension of the power to charge increased rates permanently. The increase was originally given under an Order which was strictly temporary in character, and which contained a provision, inserted at the instance of the Gas Company, requiring the Trustees to spend the additional revenue obtained as the result of the increase of rates for the benefit of the harbour undertaking; and it was pointed out by the Gas Company that, under the powers sought in the present Bill, the Trustees would be able to apply the revenue to purposes of a different character.

Mr. C. F. BAKER (Messrs. Bircham & Co., Parliamentary Agents) said that, whereas the Bill originally provided for a permanent increase of the statutory maximum rates by 100 p.ct., it was now provided that the increase should operate for three years from December, 1925.

There was a clause in the Bill providing that, if the Gas Company and other bodies mentioned, and the Harbour Trustees, should agree in writing a scheme for the reorganization, reduction, and consolidation of the existing capital of the Trustees, for the raising of additional capital by the Trustees, and the reconstitution of the Trust, and other incidental matters, the Trustees are to promote a Bill in the next available session of Parliament to give effect to this scheme, and to include such other matters as may be agreed between the parties mentioned. If no Act to give effect to such a scheme has been obtained by the Trustees before Oct. 1, 1927, the Gas Company and the other bodies may promote a Bill for the purpose.

Replying to questions by the Committee, Mr. Baker said that this arose out of efforts which were being made to agree to a scheme between local authorities and the Gas Company on the one hand, and the security holders on the other, for the reorganization of the finances of the Trustees. What was being aimed at was the reduction and consolidation of capital.

Asked why the Gas Company were included, he said that they had a very large interest in the success of the Harbour, as the gas-works were dependent upon it.

LEGAL INTELLIGENCE.

GAS PIPES AND ROAD FILLING.

Liverpool Corporation to Pay Damages.

At the Manchester Assizes last week Mr. JUSTICE FINLAY gave judgment in an action which had been heard by him on four days at the last Liverpool Assizes. The substance of the case was a claim by the Huyton and Roby Gas Company, Ltd., for damages from the Corporation of Liverpool for injuries to their gas mains alleged to have been caused by the negligence of the defendants or their contractors.

The Judge held that a series of six fractures which occurred in gas pipes of the plaintiff Company in Archway Road and Roby Road during 1923, 1924, and 1925 was caused by the failure of the contractors, who laid down a water main for the defendant Corporation in 1923, so to restore the road as to afford adequate support to the gas pipes of the plaintiff Company. He was satisfied on the evidence that the fractures complained of, which resulted in several explosions of gas, were caused by subsidences which imposed an undue strain on the gas pipes. As to the suggestion for the defence that the plaintiff's pipes were laid too near the surface for safety, the Judge said it might be expedient in modern practice, having regard to the greatly increased strain imposed by the passage of heavy vehicular traffic at high speeds, to lay pipes deeper under the surface; but this did not relieve the defendants of their obligations. Before the water main was laid, there were no fractures in the gas pipes; and afterwards there were six fractures, of which no less than four occurred at points where the water main crossed the line of the gas pipes.

Mr. Justice Finlay dealt at some length with the defence that the plaintiffs were debarred from recovering under a provision of the Public Authorities Protection Act, 1893, which enacts that no action may lie unless begun within six months of the cessation of the acts complained of. He held that the time limit mentioned did not begin to run until the neglect ceased. In this case the defendants were under an obligation to fill-in the road properly after excavating. The road was not filled in with due care, and was still in the same condition; and the defendants were liable for damages caused by their failure and neglect.

He gave judgment for the plaintiff Company for the full amount claimed (£83), and, referring to the plaintiff's original claim to an indemnity, said that probably the judgment he had given would fulfil the same purpose; but as Counsel had agreed that the claim for an indemnity could not be pursued, he gave no judgment on that issue.

Public Lighting at Hereford.—In view of the criticism evoked in consequence of the discontinuance of public lighting, it has been decided to resume the public lighting until the date of next meeting of the Town Council, when the whole subject will be reconsidered.

Accrington and District Gas Board.—At a meeting on May 28, Mr. A. J. Harrison (General Manager) said they had just balanced their accounts for the municipal year. The increase in gas sales had been very satisfactory, totalling 37,352,000 c.ft. The unaccounted-for gas was less than the previous year by ten million c.ft. The expenditure on gas production and distribution was £92,143, or £3738 above last year. The income totalled £125,348, or £381 less than last year. Gas revenue had increased by £329. The total profits on gas were £33,204. Standing charges absorbed £32,878, so that there was an actual net surplus of £326. They proposed to place certain additions to plant to revenue account; and this would absorb that little surplus. It was not proposed to recommend any alteration in the prices during the present year.

MISCELLANEOUS NEWS.

BELFAST GAS UNDERTAKING.

The Engineer and Manager of the Belfast Gas-Works (Mr. J. D. Smith) has received the commendation of his Committee on the satisfactory nature of his annual report. His recommendation to extend the power rate to include gas used for cooking in hotels, restaurants, and large catering establishments was adopted.

The report shows the balance brought forward from the previous year to be £11,492. As the result of last year's working, this had been increased to £19,827. The gas made showed an increase of 120 million c.ft. The quantity of coal carbonized was greater by 10,187 tons. The production of water gas was reduced by about 12 p.ct.; and consequently there was a saving of 423,725 gallons of oil. The sale of coke continued to expand. The extra revenue from this source amounted to £13,650, and the sale had been very steady. The demand for gas increased year by year; and this was not to be wondered at, in view of the low price charged. The increase in sales through ordinary meters was 77 million c.ft., and through automatic meters 123 millions; while the increased revenue for the year amounted to £7010. Not only was the output larger, but they had a remarkable addition to the number of consumers, the increase for the year being 1925, bringing the total number of meters installed up to 90,549.

The chemical department had continued its prosperous career. There was a substantial increase in the output of tar and ammonia; and though the revenue was only increased by £911, this was entirely due to the drop in market prices. The production of tar and liquor constituted a record, and the chemical department had not experienced any difficulty in selling the entire production. The demand for all patterns of stoves had been enormous. The future for gas was, undoubtedly, largely in this direction. The total number of fires, heaters, &c., in use was 65,895—an increase of over 7900. The process of installing in the works the best and most modern plant had gone forward steadily, and all the appliances had been maintained in a thoroughly efficient manner. Contracts had recently been placed for new exhausters, condensers, and scrubber-washers. The balance in hand at the end of the last financial year was not sufficient to justify any reduction in the price of gas for lighting; but he thought the Committee could safely extend the power rate so as to include the gas used for cooking in hotels, restaurants, and large catering establishments. They were now feeling the benefit of the policy of modernizing the works. With gas at the cheap price at which it was supplied, there was practically no limit to the possibilities of the future.

The accounts for the year show that the gross profit on the manufacture and sale of gas and residuals was £110,671, and that out of the net profit a sum of £11,473 was paid in respect of dividends and sinking fund on the City Hall stock.

SAFEGUARDING OF INDUSTRIES ACT.

Gas Mantles.

(*Continued from p.* 611.)

Friday, May 22.

The Committee resumed their inquiry on Friday, May 22.

At the commencement of the proceedings, Mr. MACASKIE (Counsel for the opponents) made the request that he be provided with the British costs of production of gas mantles.

The CHAIRMAN asked whether these costs were material to the opponents.

COUNSEL submitted that they were.

The CHAIRMAN said that the applicants had given their costs to the Committee privately, and the opponents also could give their costs *in camera*.

Mr. *Soper* then re-entered the witness box, and was questioned further by the Chairman. As to the British exports of mantles, he said these totalled slightly over three million mantles a year. He believed that about 95 p.ct. of these went to the British Dominions, and practically none to foreign countries, because the British manufacturer could not get into those countries.

As to Mr. Soper's statement, in evidence, that he would prefer a flate rate to an *ad valorem* duty on imported gas mantles, the Chairman asked what it was considered this flat rate should be.

Mr. *Soper* said that under the Safeguarding of Industries Act, 1921, a 33⅓ p.ct. *ad valorem* duty was imposed. At present the average import price of German mantles was 21s. per gross, and the equivalent of that duty would be 7s. per gross. This, however, would not afford protection against importation from countries where conditions of labour were more unfair than in Germany. He considered there should be a flat rate duty of 10s. per gross.

Mr. *Bernard Hiller* (Traveller, of Messrs. Joseph T. Robin, Ltd.) gave evidence to the effect that it was hardly possible to sell British mantles against foreign mantles. He was selling the ordinary standard mantle, his minimum price being 26s. per gross, but it was very difficult to sell at that price. In reply to the Chairman, he said that German mantles were sold at a little over 20s. per gross, and those from other countries were sold at lower prices.

Witness, replying to Sir John Barran, said that in very few cases did the user of the mantle get any advantage in price as between the British and the foreign mantle. The mantles which he sold to the wholesaler he had seen retailed at 4d. or 4½d., which was equivalent to about 54s. per gross, and the retail price of the German mantle, which came into this country at about 20s. a gross, was 4½d. He had also seen both British and foreign mantles retailed at 6d.

Mr. *Benjamin Bark* (Works Manager of the Welsbach Light Company, Ltd.) then gave evidence. Questioned by the Chairman as to wages in this country, he said that they were adjusted by the Joint Industrial Council, and rose or fell in accordance with a rise or fall in the cost of living. There was also a system, arranged by the Joint Industrial Council, by which manufacturers employed learners. He explained that, if they employed girls with no knowledge of the business, those girls were absolutely useless for a time. Therefore, they did not earn the full rate of pay until after a period of six months. The minimum rate of wage for girls of 18 years or over was 6½d. per hour, which, for a full week of 48 hours, made a total wage of 26s. There was no maximum wage; this depending upon the efficiency of the individual worker. About 60 p.ct. of the workers in the Welsbach factory were on piece rates, and 40 p.ct. on time rates; the piece rates being arranged in order to allow the efficient worker to earn 25 p.ct. above the time rates. Labour costs amounted to about 35 p.ct. of the total cost of production of the mantle. But labour also entered into the costs of the raw materials, and he estimated that, if the labour involved in the manufacture of the raw materials used by mantle manufacturers was also taken into account, the cost of labour represented about 60 or 70 p.ct. of the total cost.

Miss *M. Harwood* (Forewoman, Messrs. Joseph T. Robin, Ltd.) confirmed Mr. Bark's evidence as to the minimum time rates and the 48-hour week. In Messrs. Robin's Factory, about 70 p.ct. of the girls were on time work and about 30 p.ct. on piece work.

Mr. *C. H. Wilcox* (Traveller, Messrs. Lighting Trades, Ltd.) said he had had fourteen years' experience in selling mantles, and found competition more severe than before the war.

Questions were put by Sir John Barran as to the margin of profit made by the wholesaler and retailer as between British and foreign mantles, and witness replied that this was arranged by the retailer and wholesaler. The wholesaler sold according to the profit he wanted; but if he sold British and foreign mantles at the same price, then he obtained less profit on the British than on the foreign. There was competition among British manufacturers.

Replying to Mr. Aiton, witness said that a wholesaler was sometimes satisfied with a profit of 4s. per gross on foreign mantles, and therefore sold to the retailer at a price below that at which the British manufacturer could sell to the retailer direct. The difference between the wholesale prices of foreign and British mantles went to the wholesaler and retailer in varying proportions.

Asked whether a mantle was used until it lost its luminosity, or whether it was destroyed, witness said that, generally speaking, it was destroyed.

Mr. *H. Talbot* (General Manager, Welsbach Light Company, Ltd.) then gave evidence, additional to that which he had given *in camera* with regard to costs of production. Since his appointment as Manager of the Welsbach Company he had found it difficult to keep the Company's Wandsworth factory employed with orders for gas mantles, in consequence of the unfair foreign competition to which the business had been subject. The year ended March 31, 1925, was probably the most difficult that he had experienced, and especially the last five months of that year. While the duty on German mantles under Part II. of the Safeguarding of Industries Act was in full operation, and after the stocks of imported mantles had been exhausted, there was a slight temporary movement in the British mantle trade; but the duty was allowed to lapse when the trade were beginning to reap some slight benefit from the Act. Unfortunately, also, imports of mantles from other countries increased as the German import figures decreased. Mr. Talbot then gave information with regard to wages, prices of raw materials, &c., which he had obtained in Germany in February of this year. He had visited both Germany and Italy. Labour costs, he said, represented about 35 p.ct. of the total production cost of a mantle, starting with the mantle manufacturers' raw materials; but he would not like to make a guess at the moment as to what percentage of the total cost, including the manufacture of raw materials, was represented by labour.

Asked why the prices of raw materials were higher in this country than in Germany, he said that one factor was the lower labour costs in Germany; and if this applied to the mantle industry, it must apply to the industries which made the raw materials. It was pointed out by the Chairman that ramie yarn was the same price in England and Germany; and one of the things that occurred to Mr. Talbot, in explanation, was that the raw material used by the German and British ramie yarn manufacturers came from the same source. He had no knowledge as to whether the price was an arranged one. In the case of other raw materials—except gas, which was a trifle cheaper in England than in Germany—the prices were higher in this country than in Germany.

Asked what duty he would suggest should be imposed on German mantles, Mr. Talbot said that the German manufacturer was getting an advantage over the British manufacturer, as shown by his figures, of 10s. per gross. He suggested that this should be the amount of the flat rate on German mantles; and that the rate should be higher on mantles from other countries.

Mr. MACASKIE, in reply to questions by the Chairman, said he was going to question the suggestion that the rates of wages in foreign countries were as low as it was said they were. He was also going to suggest that the prices of raw materials in Germany and in this country, as given by the applicants, were not accurate.

Mr. *Soper* said the figures the applicants had given were the current prices in this country.

In adjourning the proceedings until June 4, the Chairman said he wanted to give Mr. Macaskie every opportunity to rebut the evidence put forward by the applicants.

As to a suggestion that the Committee should consider the conditions in Germany and Poland only, and not in Austria and Italy, in order to shorten the inquiry, Mr. Soper asked whether the opponents would admit that the wages and conditions of employment were worse in Austria and Italy than in Germany and Poland. If the opponents admitted this, and the Committee found that conditions in Germany and Poland were unfair, then it followed that conditions in Austria and Italy were also unfair. Mr. Macaskie intimated that he was willing that the matter should be decided on German and Polish competition; Italy and Austria manufactured only 1 p.ct. of the mantles sold in this country.

The Committee decided to rule-out countries other than Germany and Poland.

SOUTH AFRICAN LIGHTING ASSOCIATION, LTD.

Annual Meeting.

The Thirty-sixth Ordinary General Meeting of the shareholders of the South African Lighting Association was held at No. 90, Cannon Street, London, E.C., on Wednesday, May 27. Mr. WILLIAM CASH (the Chairman of the Association) presided.

The SECRETARY (Mr. William Cash, Jun.) having read the notice convening the meeting, the minutes of the last shareholders' meeting held on May 28, 1924, and the Auditor's report on the accounts for 1924,

The CHAIRMAN moved the adoption of the Directors' report and accounts for the year to Dec. 31, 1924. In doing so, he said that the year 1924 had been both a disappointing and a difficult one, both for the Directors in London and for the officers at Port Elizabeth and Grahamstown. The report really summed-up the position during the past year, and the reasons why the results were not so good as they had hoped. Dealing first with the position at Grahamstown, he said the results were pretty much what had been anticipated. The municipal electricity undertaking was opened there in the middle of 1924, and it was unavoidable, of course, that the business of the Association would be affected thereby. On the whole, the results were not worse than the Association might reasonably have expected, having regard to their experience at Port Elizabeth and elsewhere, when electricity was first introduced, and where previously gas had had a monopoly of lighting and heating. For the whole year the consumption of gas was down only by 18 p.ct., but in the second half-year the decrease was larger than this; in the September quarter the consumption was down about 33 p.ct., and in the December quarter 40 p.ct. One satisfactory feature was that comparatively few of the consumers had given up the use of gas. The Association had lost only about 9 or 10 p.ct. of the consumers; but the public lighting had gone over to electricity. The street lamps had been disconnected, and the Association had incurred a certain amount of expenditure in doing this, though part of the expenditure had been recovered from the municipality. It had affected the business in that the profits in the fittings department showed a drop of some £300. On the other hand, the Association's officers had done all they could to save expense. The repairs items were considerably less in respect of both the works and the meters. The staff had been reduced, and the officials at Grahamstown were doing all they could—not altogether unsuccesfully—in pushing the use of gas for both cooking and heating. The net cost of coal there had been somewhat less, and labour costs were also down. Summing-up the whole position, it would be seen that the drop in profits on the year was about £2480; but £1000 was accounted for by the difference in the profits at Grahamstown, which had been unavoidable. The most unsatisfactory part of the position there was the subsidizing of the electricity undertaking by the municipality. They were carrying it on at a loss—a substantial loss. He need hardly say that competition of this sort was very unfair; but the Association had no control over it, and so far as the losses incurred on the electricity undertaking had to be borne by the rates, there was the still more unfair result that the Corporation injured the Association's business and yet asked the Association to contribute to the stabilization of their undertaking. With regard to Port Elizabeth, the Directors were disturbed and dissatisfied with the state of affairs out there, and had asked Mr. W. Arnott (who was Manager there for a number of years) to pay a visit to South Africa. They had asked him particularly to go into the question of the heavy leakage which had occurred, and which had been mentioned at the shareholders' meetings both by himself (Mr. Cash) and his predecessor in the chair for a number of years. Mr. Arnott (who was present at the meeting) had devoted himself particularly to the distribution side of the business, and had conducted an overhaul of the mains. He had also taken steps to cut off a large number of the old services which it was thought might possibly account for the leakage, and he had gone into the question of the meters again. The effect of this had been that the expenditure on repairs of works, mains, and meters had been exceptionally high. Mr. Arnott had not found anything so seriously wrong as to account for the high leakage. Mr. J. Donaldson, who was Manager there, had returned home. The Association had appointed a new Manager, Mr. P. C. Cleasby, who had arrived at Port Elizabeth in March. He had told them that further expenditure was necessary on some of the plant at the works. Port Elizabeth was said to be the most progressive town in South Africa, and Mr. Cleasby said that he saw no reason why the Association's business there should not double in the next ten or fifteen years. With regard to the price of gas, it was evident to the Directors that, for the last two or three years, in view of the expenditure which had been necessary in order to catch up arrears of works which had arisen during the war, it had been too low. They had determined that from July next the price must be raised. The Directors, as was shown in the accounts, after consultation with the Auditor had started a renewal fund. The Association had built up out of profits over a long series of years a reserve fund of £27,000. They had been building up a special renewal fund to deal with repairs of retorts on a definite and fixed basis, and this had reached a reasonable figure to meet the expenditure on retorts which occurred at infrequent intervals; this expenditure being heavy because of the necessity for sending material and labour from this country. In addition, the Directors had transferred the sum of £7000 from the general reserve, and had christened it a "renewal fund." It was felt that if they were faced—as at the moment they were—with a certain expenditure of an exceptional character, it was only reasonable and wise to charge that definitely to a renewal fund which had been built up out of profits. Mr. Cleasby had reported that, if this business was going to grow, the time was approaching when it would be necessary to do some expensive repair work to the two smaller holders at Port Elizabeth. In addition, certain of the other plant would need attention. It would be unfair that the necessary expenditure should fall on any one year; and provision had been made for it in advance. With regard to the other figures for the year, repairs of works, mains, and meters had been very heavy—nearly £1000 more than it was a year ago. Coal had cost less. On the other hand, the year had been unsatisfactory in connection with tar. The municipality, which used to take the tar for roads, were now using different material. The Association, however, were trying to meet this difficulty by treating the tar. Again, in order to induce people to take fittings, the Association had cut prices to a certain extent, and profits under that head were not so good. The year had also borne the expense of Mr. Arnott's visit to Port Elizabeth. All these things had conspired together to make 1924 a poor year. On the other hand, he felt—and he believed the shareholders would agree with him when they had heard Mr. Arnott—that there was no need to be in the least despondent about the undertaking. During the year, at Grahamstown they had lost 90 consumers out of 1130; at Port Elizabeth the ordinary consumers had increased slightly. As to dividend, the Directors were only recommending 5 p.ct. this year. In this undertaking, however, there was an advantage arising from the refund of income-tax, and the income-tax for the year on the whole dividend would be 2s. 3½d. in the £, as compared with the ordinary English rate of 4s. 6d. in the £. Thus, while they were really paying 5 p.ct., or a net dividend of £4 8s. 6d. p.ct., if it were an English dividend, subject to income-tax at 4s. 6d. in the £, the net dividend would be £3 17s. 6d.; the 5 p.ct. paid by the Association was, therefore, the equivalent of an English distribution to the shareholders, not of 5 p.ct., but of 5¼ p.ct., which would give a net return of £4 9s. 2d. p.ct.

Another matter to which the Chairman referred was the alteration on the Board. Mr. Henry Woodall, a brother of the late Sir Corbet Woodall, had been a Director of the Association since 1901. His services had been of great value to the Association, but he had asked to be relieved of his duties because of the difficulty of travelling to and from London. In these circumstances, the Directors had felt that it would be advantageous to the Association if they asked his nephew, Mr. Henry Woodall, Jun., who was the son of the late Sir Corbet Woodall, to become a Director. He was Chairman of several large English gas undertakings, and he had erected the Association's works at Grahamstown, so that he knew something of South Africa. When his firm were engineers to the undertakings, he had been in constant touch with all that went on in South Africa, so that he did not come to the Board without knowledge of the undertaking. The Association had been very fortunate in having persuaded Mr. Woodall, Jun.—who was a very busy man—to join the Board.

Finally, the Chairman said that the Directors had had a rather anxious and worrying year, and had done all they possibly could. Mr. Jesse F. Scott (Consulting Engineer), who wrote every week to Port Elizabeth and Grahamstown, and received reports from there every week, had done all that was humanly possible to see that the works were carried on to the best advantage. The leakage question, which had troubled the Board exceedingly, was a mysterious matter. Night tests had been taken, the plant examined, and a lot of money spent on overhauling meters. He expressed the hope that in the current year they would reap some substantial advantage from Mr. Arnott's visit to South Africa.

Sir CHARLES J. JESSEL, Bart., seconded the adoption of the report and accounts.

Mr. WILLIAM ARNOTT, reporting upon his visit to the Cape, said that when he was there they had overhauled, tested, and cleared from naphthalene as many of the principal mains as was practically possible; most of the testing for leakage being done at midnight. Several cases of broken mains and leakage of gas had been found. They had also opened-out and cut-off all old and disused service pipes and mains, which in many cases were in very bad condition and leaking. Some of them had been laid many years, and had rusted away by the action of the soil. Over 600 services had been cut-off at the main; and this should show good results this year in reduced leakage. In Port Elizabeth there had been a remarkable change for the better, which impressed one after seven years' absence. The town had gone ahead, and all around there were signs of prosperity, as shown by the number of good-class houses erected. There was a great future before Port Elizabeth as a manufacturing town, and before the Association in the increased supply of gas for cooking, water heating, and heating for manufacturing processes, which would have to be met by more gasholder storage, and by extending and increasing the size of the mains. Gas must be more advertised, as was being done in England; and new business must be canvassed for. It was there for the seeking. With a greatly increased output of gas, which should naturally follow, the actual amount of leakage would not be increased, but the percentage would be very much reduced. The small output of gas at Port Elizabeth for the large area supplied and the long length of mains in use (some 45 miles or so) made the leakage high in percentage, though small per mile of main. Mr. Sterley (the Local Secretary at Port Elizabeth) and Mr. Hart (the Local Secretary at Grahamstown) were both very keen workers in the interests of the Association, and were ideal Secretaries. The Association were fortunate in having two such men in charge of the financial side of the business, which, he could testify from personal experience, could not be in better hands.

Mr. R. W. LONG asked if the amount put aside for the renewal fund was likely to be sufficient to meet the cost of all repairs, or whether there was likely to be a further charge on the revenue in the future.

Dr. E. C. CARTER, speaking of leakage of gas, said he was glad to hear that it was due to faulty mains, and not to any stealing on the part of customers.

Mr. ARNOTT said there was not a single case of this.

Dr. CARTER, referring to the Chairman's remarks as to competition with electricity at Grahamstown, said that the capital sunk in the works at Grahamstown was not more than one-third of that sunk in the Port Elizabeth Works. He asked whether there was a competing electricity undertaking at Port Elizabeth, and suggested that, if there were not, then the Association might undertake the supply of electricity as well as gas. It always seemed to him that a gas company was one of the most suitable undertakings for taking on the supply of electricity.

The CHAIRMAN pointed out that the Corporation were supplying electricity at Port Elizabeth.

Mr. HAYES asked if there had been an opportunity for checking the meters for a complete quarter since Mr. Arnott had carried out the alterations to the mains and services, and, if so, what the result had been.

The CHAIRMAN, replying to the questions asked, said that a report had been received from the Engineer, who put the total amount that might possibly be spent on overhauling everything he could think of at something rather less than the amount transferred to the renewal fund, so that it could be taken that the £7000 in that fund would cover everything. There was also the balance of the retort renewal fund, which was another £2300, so that they were amply covered. In fact, he did not know that it would be really necessary to spend anything like this amount. With regard to electrical competition, the Association had been through that experience at Port Elizabeth, where for a time they had lost a very large proportion of the gas consumption; but this had now been regained. Grahamstown, however, was not growing in the sense that Port Elizabeth was. It was a residential, and not a business, community; so that it might take longer to restore the old position there. He added that Dominion coal had been used, but Mr. Cleasby proposed to use a more expensive coal, and one which would give a better yield. All these matters were continually before the Directors.

Mr. HAYES asked what was the present price of gas.

The CHAIRMAN replied that it was 7s. 8d. net per 1000 c.ft. at Port Elizabeth (8s. 4d. per 1000 c.ft., less discount).

Mr. HAYES commented that this was very low.

The CHAIRMAN agreed that it was low for a Colonial town, and was the lowest in South Africa. It was considerably below the price at Cape Town, where there was a much larger undertaking, and one which was better situated than that at Port Elizabeth.

Mr. HAYES, referring to the increased demand foreshadowed by Mr. Arnott in Port Elizabeth, asked whether the existing works were capable of meeting that increase.

The CHAIRMAN said the increased demand would mean expenditure on holders, and possibly on purifying plant. On the question of leakage, he added that, curiously enough, Cape Town suffered from a very heavy leakage.

The report and accounts were adopted.

DECLARATION OF DIVIDEND.

The CHAIRMAN proposed that a dividend of 5 p.ct. for the year, subject to income-tax on the final dividend (2 p.ct.) of 5¾d. in the £, less the interim dividend already paid (3 p.ct.), be declared. He pointed out that on the backs of the dividend warrants there was a most complicated calculation which the Inland Revenue authorities insisted upon being put on the documents. The rate of income-tax for the whole year would be 2s. 3¼d., and the rate on the final dividend was only 5¾d. It was a difficult calculation, but it was necessary to put it on the warrants, because of the question of reclaiming tax to those shareholders who were entitled to a reclaim.

Mr. T. N. G. JENNINGS seconded.

The resolution was carried.

RE-ELECTION OF MR. HENRY WOODALL, JUN.

The CHAIRMAN moved that Mr. Henry Woodall, Jun., be re-elected a Director of the Association.

Sir CHARLES J. JESSEL, Bart., seconded.

The resolution was carried.

Mr. HENRY WOODALL, returning thanks, said he had been connected with the Association for a great many years, and it was a real pleasure to come back and to do what he could to serve them.

On the proposition of Mr. R. W. LONG, seconded by Mr. HAYES, Mr. Percival D. Griffiths, F.C.A., was re-elected Auditor, at a remuneration of 40 guineas.

VOTES OF THANKS TO OFFICERS AND STAFF.

The CHAIRMAN moved a resolution of thanks to the officials at the Cape. Mr. Sterley (Local Secretary at Port Elizabeth), an old and valued servant, was still there; Mr. Cleasby (Manager) had recently begun his work; and Mr. Hart (Local Secretary at Grahamstown) was continuing to give the really valuable service he had given for a good many years.

Mr. F. R. SMITH seconded, and proposed a vote of thanks to the Board. He also expressed his appreciation of the foresight of the Board in getting Mr. Henry Woodall, Jun., to join. Mr. Woodall, with his great experience, would be a source of great strength, and they all looked forward to better times for the Association.

The votes of thanks were accorded with acclamation, and the proceedings terminated.

Gas Meter Testing at Glasgow.—In his report on the work of the Gas Meter Testing Department for the year 1924, Mr. S. B. Langlands says that the number of meters tested was 39,035, and the amount of fees collected £2276. Of the total number of meters tested, 38,202 were new and repaired meters, and 833 were sent in by gas consumers for certification as to correctness.

Wiessoe Foundry and Engineering Company. Ltd.—At the fifth annual meeting of the Company next Friday, the Directors will report a net profit for the year ended March 31 of £19,281. With the sum brought forward, there is £24,121 available for distribution, out of which the Directors will recommend the payment of a dividend of 10 p.ct., free of income-tax. This will absorb £20,000.

Bombay Gas Company, Ltd.—An extraordinary general meeting of the Company was held on May 27—Mr. W. G. Bradshaw, C.B.E., in the chair—for the purpose of confirming as a special resolution the extraordinary resolution passed at the extraordinary general meeting held on April 29 (*ante* p. 384). The Secretary (Mr. A. Dickson, jun.) having read the notice convening the meeting, the Chairman moved: "That each of the existing £5 shares be divided into five fully-paid-up shares of £1 each." Mr. H. H. Macleod (Deputy Chairman) seconded the motion, which was unanimously agreed to. The proceedings then terminated.

MONTEVIDEO GAS AND DRY DOCK COMPANY, LTD.

A Satisfactory Report.

The Fifty-Third Ordinary General Meeting of the Company was held last Wednesday, at Dashwood House, Old Broad Street, E.C.—Mr. FRANK H. JONES in the chair.

The SECRETARY (Mr. Henry Kearns) read the notice convening the meeting; and the minutes of the last meeting were taken as read, as also were the report of the Directors and the statement of accounts.

The CHAIRMAN said he had to apologize for the absence of Mr. Charles Hunt (the Chairman of the Company) who was away. He would ask the Secretary to read a speech which had been prepared by Mr. Hunt.

The SECRETARY thereupon read the speech, which was to the effect that at the last meeting it was unfortunately necessary to draw attention to the indifferent results obtained from the Dock and Workshops Department. For the year under review, it was, however, gratifying to be able to report that the turnover therefrom had increased by no less than £22,012, though, as stated in the report, the resulting profit had been a comparatively small one. On the other hand, in the Gas Department the progress had been substantial, both from the selling and production points of view. As regards production, the installation of further beds of retorts and coal handling machinery had now been completed, and the whole of the retort house plant and other machinery had been made more efficient. Moreover, the purification plant had been increased, and the overhaul of the mains, and the substitution of larger pipes, was being continued. This had had the effect of increasing the capital expenditure by £21,012, and the capital account was now overspent by £3719. That this expenditure was necessary, and had been wisely made, was proved by the increase in gas sales of 8½ p.ct., while the number of consumers had increased by 6·38 p.ct. This showed that the better supply of gas now obtainable, and the improved pressures at which they were able to deliver it, had brought about a larger average consumption; and it would have been still larger had they not been obliged to supply a very rich gas in order to keep the consumers satisfied in those districts where the mains had not yet been dealt with. While dealing with this question of capital, the shareholders would be interested to know that, if the bank would continue to accommodate them, the Board were hopeful of getting through this year without recourse to the issue of new capital. Stocks were £6076 higher than in the previous year. This arose chiefly from the value of cookers on hire, which were becoming increasingly popular; and the Directors had reason to believe that the efficient stoves the Company supplied to the public, their cleanliness and ease of control, and the large reduction of labour which they secured in the household, would encourage many more to adopt them. It was still the aim of the Board to give the City of Montevideo, which was increasing rapidly, a really efficient and reliable supply of gas, as they were sure that this was the best means of securing a still larger number of consumers each year, and that it would lead to the adoption by them of other gas apparatus, both for the home and for manufacturing and industrial purposes. The stock of pipes also showed a considerable increase, but it was their policy to keep the works fully supplied, so that the work of enlargement could be energetically pushed ahead. The stock of coal on Dec. 31 was smaller in quantity, and fortunately lower in average cost, than at December, 1923. A further satisfactory feature of the accounts was that, though exchange showed a loss of £12,394, it was nevertheless a reduction on the previous year of £6950. The remittances from Montevideo were £17,000 more; but the average rate was 45·42d. per dollar as compared with 41·38d. in the previous year, and as the rate of exchange was now about 48d., the loss this year—if this higher rate was maintained—would be sensibly reduced. Although the revenue had increased by £41,030, the expenditure has increased by £43,775—reduced by the smaller loss on exchange to £36,825. Part of this increased expenditure naturally followed through the payment of additional wages and the cost of extra materials due to the increased business in both the Gas and the Dock Departments. Further, they had charged in the year's accounts the balance of the cost of renewals in connection with the damage suffered from the severe storm in July, 1923; and there had also been heavier expenditure chargeable to repairs and maintenance, owing to the enlargement of the mains, part only of which could be treated as capital expenditure. However, the balance of revenue account, at £41,592, showed an increase of £4,206; and after providing £6494 for depreciation of capital accounts, and £1521 for depreciation of cookers on hire, they had been enabled to transfer £4500 to deferred maintenance, in which was included an amount towards the cost of the gasholder to be erected in the current year. They were commencing the shipment of the materials this month; and when the erection of the holder had been completed—which it was hoped would be in time for next year's winter season—the Board believed that the additional storage would tend to more economical working, and extend the life of the retorts, which at present had to be fired-up and let-down to suit the varying demands, which were very heavy at certain times of the day, and slight at others. The consequent wear and tear was therefore considerably more than if more regular working could be secured. It was not easy to forecast the results for the current year. So far this year the Dock Department, which was always a very fluctuating business, had secured a satisfactory share of the work to be executed, and had been fairly well employed. The number of gas consumers continued to increase, and a satisfactory number of additional cookers had been fitted each month. Residuals, which last year gave an excellent increase, compared with the year 1923, would, it was feared, not be so satisfactory. Coal was now being sold in Montevideo at very low prices. As the value of coke depended in a large measure upon the selling price of coal, the revenue obtained for this residual showed a reduction compared with the early months of 1924; but it was to be hoped that the competition would be less severe, and that coal would be sold at prices which yield a fair margin of profit. They could, of course, use their coke, and produce a larger quantity of water gas; and this would obviate throwing it upon the market at an unremunerative price. The plant

and property had been maintained in a very efficient condition; and the extension of the plant was sufficient to meet a considerable increase in output. With regard to their former General Manager, Mr. T. F. Lane, who was elected to the Board on his retirement, the Directors regretted that he had been obliged to relinquish his seat, as he had found it impossible to take up his permanent residence in this country. It was not proposed to fill this vacancy, but to carry on with four Directors as formerly; and the fees would be proportionately reduced.

The CHAIRMAN moved the adoption of the report and accounts; and this was seconded by Mr. JOHN MEWS, LL.D.

Mr. C. C. MALLET said he had recently had an opportunity of seeing the works; and what had struck him more particularly was that, owing to the advancement of Montevideo, the Company's freehold land possessed immense value. He reckoned the site alone was worth about two-thirds of the capital of the Company. He also desired to refer to the good work of the employees. He met Mr. J. N. Whyte (the Engineer and General Manager), Mr. J. S. Ryan (the Superintendent of the Dock Department), and Mr. D. C. Clark (the Engineer-in-Charge of the gas-works), and found them all most zealous in the Company's interests. The report was a very good one, in the circumstances which existed in the River Plate and in the gas industry.

Mr. HOWEL J. J. PRICE also congratulated the Board on the excellent character of the report and balance-sheet.

The report and accounts were unanimously adopted; and a dividend on the ordinary stock was declared, for the half-year to Dec. 31, of 2 p.ct., free of income-tax, making, with the interim dividend, 4 p.ct., free of income-tax, for the year.

Mr. John Mews was re-elected a Director, on the proposition of the CHAIRMAN, seconded by Mr. W. EDGAR HORNE; and the Auditors (Sir Laurence Halsey and Mr. William C. Sneath, partners in the firm of Messrs. Price, Waterhouse, & Co.) were re-appointed, on the motion of Mr. CLIFFORD H. HUNT.

The CHAIRMAN proposed that the best thanks of the meeting be given to the officers, staff, and workpeople, both here and in Montevideo. All did their very best for the Company.

This was seconded by Mr. MALLET, and acknowledged by Mr. KEARNS.

The proceedings concluded with a vote of thanks to the Chairman and Directors, which was proposed by Mr. PRICE, and seconded by Mr. HUNT. The mover voiced the regret of the shareholders at the absence of Mr. Charles Hunt.

WORTHING GAS COMPANY.

Special Order to be Applied For.

An extraordinary general meeting of the Worthing Gas Light and Coke Company was held on May 23 for the purpose of approving application for a Special Order, under section 10 of the Gas Regulation Act, to enable the Company, among other things, to extend their area of supply.

Mr. WILLIAM CASH (Chairman of Directors) said that the real object of the Order was to enable them to extend their area of supply. They had had in the past, on many occasions, requests to take a supply into the parish of Findon; but as this was beyond their statutory area, it was necessary for them to extend their area by a Special Order. As they were making this application, the Directors thought they would take the opportunity of bringing some of their regulations up to date, and slightly amending some of the provisions of the Act of Parliament of 1907, which were mainly administrative, in connection with the Company. The time by which local authorities could lodge objections to their application had not yet expired, but he did not think it likely that they would meet with serious opposition. The Chairman then proceeded to refer to the various clauses in the application, and in referring to that concerning the parish of Ferring, he pointed out that this parish was within the area of supply of the Littlehampton Gas Company, but they were not attempting to do anything inimical to the interests of the Littlehampton Company if they were prepared to give a supply. They had been asked to go there and give a supply to the parish. Mr. Cash also pointed out that they were seeking powers to raise additional capital. In regard to the price for supply at Findon, he said that for the first five years it was proposed to charge 2·4d. per therm above the price ruling for the time being at Worthing. They were seeking to be empowered to pay interim dividends. There was another clause dealing with pensions.

The CHAIRMAN then moved that approval be given to the application. The DEPUTY-CHAIRMAN seconded, and the motion was unanimously approved.

Visit to the Works of Messrs. Peebles & Co., Ltd.—Members of the Glasgow Corporation Lighting Association, to the number of 60, visited the works of Messrs. Peebles and Co., Ltd., Tay Works, Bonnington, Edinburgh, on Saturday, May 30, and made an exhaustive inspection of the manufacturing operations in connection with meters and gas governors. The visit proved of great interest, and was much appreciated. Mr. S. B. Langlands, Hon. President of the Association, and Inspector of Lighting for Glasgow, accompanied the party. After the visit the firm entertained the party to luncheon.

"S.B.G.I." Golf Challenge Bowl.—Fourteen members of the British Gas Industries Golfing Society took part in the competition at Sundridge Park on Tuesday, May 19, for the Yates Challenge Bowl, which was presented several years ago by Mr. H. James Yates (Chairman of Radiation, Ltd.). The winner was Mr. C. A. G. Thomas (E. & J. Pearson, Ltd., of Stourbridge). Mr. R. P. Chester was second, and Mr. H. M. Thornton (Director of Radiation, Ltd.) was third. One of the Past-Presidents of the Society, Sir Arthur Duckham, entered for the competition, but at the last moment was prevented from attending.

EASTBOURNE GAS COMPANY.

Proposals for raising additional capital in order to cope with increased business were submitted by the Directors of the Eastbourne Gas Company at an extraordinary general meeting of the stockholders, held on Thursday, May 21.

DIRECTORS' PROPOSALS

The following resolution was submitted:

"That the Directors be empowered to issue the remainder of the authorized capital (stock) amounting to £38,590 either as ordinary B stock or as 5 p.ct. preference stock, or partly as one of those stocks and partly as the other of them, and at such time or times and in such manner as the Directors shall deem best."

Also, "That the Directors be further empowered to issue the authorized loan capital (at present unissued) amounting to £79,167 as mortgage bonds, debentures, or 5 p.ct. debenture stock, or partly in one and partly in the other or others of those ways, and at such time or times and in such manner as they deem best."

The CHAIRMAN (Mr. Caleb Diplock) formally moved the resolution.

REASONS FOR FRESH CAPITAL.

The DEPUTY-CHAIRMAN (Mr. Frank H. Jones), after saying that he had much pleasure in seconding the resolution, explained the purpose of the meeting and the need for raising fresh capital. Parliament had said—and the Company could not act without such sanction—that the Company could raise £117,757—£38,590 as ordinary stock, and the balance as loan capital—and the Board were asking the stockholders to give them the necessary authority to do so. The Company had not raised any new capital for many years. When requiring money their practice had been to obtain loans from the bank, and at the present time they owed the bankers about £22,000. The balance-sheet for last year showed about £5500 invested in Consols in respect of the reserve and special purposes funds, and liabilities to those funds of just over £17,000. The Board had two things to do: First, to repay the money borrowed from the bank; and, secondly, to strengthen the reserve and special purposes funds by investing them, instead of sinking them entirely or largely in the undertaking itself. The money that came from this special appeal would therefore be used for the two purposes mentioned, and the investments in respect of the reserve and special purposes funds would be in first-class securities. More capital was naturally wanted in a fast-growing undertaking. To give them some idea of the extent of their business, he mentioned that gas was used in practically every house in Eastbourne—certainly in every house that the gas mains passed. The quantity of gas sold last year showed an increase of 6¼ p.ct. on the previous year. This year, up to the present, that increase had been maintained. The strength and growing character of the business were further indicated by the showroom sales of stoves, cookers, fires, and lighting fixtures, which amounted last year to £12,000.

After the stockholders had given their sanction, they would receive an offer to subscribe £50,000 of 5 p.ct. debenture stock. The fact that the Eastbourne Gas Company had never had any loan capital was almost unique among gas companies.

The CHAIRMAN put the resolution to the meeting, and it was carried unanimously.

Blackburn Gas Undertaking.

The annual report of the Blackburn Gas Engineer, Mr. G. P. Mitchell, states that the total quantity of gas made during the year was 1004 million c.ft.—an increase of 55,565,000 c.ft., or 5·85 p.ct. over last year. The total number of gas cooking and heating appliances in use at the close of the year was 46,879, compared with 43,805 last year. The demand for these appliances, states Mr. Mitchell, has been maintained throughout the year. The total revenue was £291,204—a decrease of £9062, consequent upon a reduction of 3d. per 1000 c.ft. at the beginning of the year. The gross profit was £61,083, and the net profit £2486. An additional contribution of £1610 had been made for the extinction of the 4 p.ct. stock. The Engineer records that the demand for gas during the last six years has increased by approximately 270 million c.ft., or 36¼ p.ct. The new showrooms in King William Street would shortly be ready for opening. The rateable value of the undertaking had been increased from £12,635 to £19,000, which would mean an additional payment to rates of £4050, equal to a charge of 1·05d. per 1000 c.ft. sold.

Lecture at Brighton.—At a meeting of the Brighton and Hove Rotary Club on May 27 Mr. C. H. Rutter, M.Inst.C.E., Engineer and General Manager of the Brighton and Hove General Gas Company, gave a lecture on "A Century of Gas Making," in which he dealt with the development of the industry and of the Brighton Gas undertaking, and gave a brief outline of the process of manufacture.

Charges for Gas Down to Pre-War Level.—At the last meeting of the Leek Urban Council reductions in the charges for gas to ordinary consumers were sanctioned—viz., "that as and from the date of the reading of the meters for the quarter ended March, 1925, the price of gas to ordinary consumers in Leek be reduced from 3s. 0d. to 3s. 6d. per 1000 c.ft., less a discount of 6d. per 1000 c.ft. for prompt payment; and that the price to ordinary consumers at Rudyard be reduced from 4s. 9d. to 4s. 6d., less a similar discount of 6d. Further, that the discount allowed to prepayment consumers in Leek be advanced from 5d. to 8d. per 1000 c.ft., and to prepayment consumers in Rudyard from 4d. to 7d. per 1000 c.ft." These revised charges for gas will bring it down to the pre-war level. Reviewing the year's working, the Chairman, Mr. N. A. Furmston, stated that considerable developments had been carried out at the gas-works, and the results had exceeded their expectations. The net loss on the year's working was about £1900; but this was largely due to the policy of spending as much as possible out of revenue and reserve fund, instead of borrowing at high rates of interest. On March 31 the reserve balance stood at £11,500.

TRADE NOTES.

Drakes' Verticals.

Messrs. Drakes, Ltd., of Halifax, in a folder bearing the title of "Vertical Retorts of Distinct Individuality," describe the main features in their form of setting. The folder is one of a series which the firm are issuing.

The "Becco-Legg" Measuring Gear.

A new list has ben published by the Becco Engineering and Chemical Company, Ltd., of Nos. 158-160, City Road, London, E.C. 1, in which they describe the "Becco-Legg" plant "XL" water measuring and reagent apportioning gear, which is suitable for all makes of water softeners and purifiers using lime, lime and soda, chalk, alum, barium, carbonate, or other reagents.

"Talisman" Oils.

Messrs. Trier Brothers, Ltd., of No. 36, Victoria Street, Westminster, have published lists of their new "Talisman" oils for motor vehicle lubrication, collieries, and general industries, and their "T.B." grease cartridges. The firm claim that "Stauffer's Lubricant," of which they have been sole makers for more than forty years, represents the standard of excellence in grease lubrication.

New Plant at Blackburn.

The Blackburn Town Council have confirmed contracts with Messrs. R. & J. Dempster, Ltd., of Manchester, for the supply and erection of one four-lift spiral-guided gasholder, with steel tank, and one two-lift spiral-guided holder, with steel tank, at the Greenbank Gas-Works; and a carburetted water gas plant at the same works to be supplied and erected by Messrs. Humphreys and Glasgow, Ltd., of London.

Blackman Fans.

The higher the temperature in workshop, factory, mill, foundry, office, restaurant, theatre, or any other public building, the greater the necessity for Blackman ventilating fans, state the James Keith & Blackman Company, Ltd., of 27, Farringdon Street, E.C. 4, in an illustrated pamphlet which they have just issued. These fans keep the atmosphere clear and healthy, and blow in or induce a continuous supply of fresh air.

"Asbestone" Patterned Sheeting.

This widely known brand of asbestos-cement sheeting is now available with attractive patterns impressed for use as fire surrounds, &c. These sheets are of handsome appearance, and are substantial in thickness. They are easy to cut and fix, and can be coloured to tone with decorative schemes. The material does not leave the impression of ugly uniformity, but has slight irregularities in texture which afford a genuine tile effect—the more so when a transparent colouring is applied. Moreover, "Asbestone" patterned sheets are inexpensive; and numerous gas undertakings are fitting this material as an economic substitute for tiled and metal fire surrounds. The manufacturers, The Cellactite Works, Ltd., of Higham, Kent (London Office and Showrooms: Lincoln House, Nos. 296-302, High Holborn, W.C. 1), have published a booklet which describes this material, and which will doubtless be of interest to gas undertakings.

CONTRACTS OPEN.

Coal.

The Gas Committee of the Borough of East Retford are prepared to receive tenders for about 9000 tons of gas coal, nuts, peas, and slacks. [See advert. on p. 686.]

The Directors of the Peterborough Gas Company are inviting tenders for the supply of 16,000 tons of best screened gas nuts. [See advert. on p. 687.]

The Gas Committee of the Corporation of Belfast are requiring tenders for the supply of 170,000 tons of best gas coal. [See advert. on p. 687.]

Tenders are invited by the Audley Urban District Council for the supply of screened gas coal. [See advert. on p. 686.]

Steel Mains.

The Gas Department of the Pontypridd Urban District Council are inviting tenders for the supply and delivery of steel mains. [See advert. on p. 686.]

Tar.

Tenders are invited by the Lancaster Corporation for 300 tons of tar produced at their gas-works. [See advert. on p. 686.]

General Stores (Iron and Steel, Castings, Shovels, &c.).

The City of Leeds Gas Committee are inviting tenders for the supply of general stores and iron castings. [See advert. on p. 686.]

Pipes and Specials.

Tenders are invited by the Gas Committee of the Marple Urban District Council for the supply of gas mains and specials. [See advert. on p. 687.]

The Bradford Corporation gas showrooms, in Darley Street, have drawn large crowds lately to inspect a magnificent window display of prizes for competition at the annual Bradford Police Sports.

The Lytham St. Annes Council have referred back to the Committee a suggestion that gas should be reduced in price. The Engineer (Mr. J. H. Ranft) recommends that the present price of 10·8d. per therm be retained, but that a sliding-scale of discounts be adopted.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

The inland coal trade of Yorkshire and Lancashire is suspended owing to the holidays. Gas coal contracts should now be undergoing completion, but in many instances this cannot be done, most works preferring to carry on their obligations and to take coal purchased and not delivered. It is not expected that the gas coal market will be good until September or October.

There is still a deadlock in the shipping trade, particularly as far as Yorkshire is concerned. Collieries are being asked to quote for supplies from Sept. 1, but are reclining, and the market is dead.

There is a feeling that more industrial fuel will be required as from July 1 next; but nothing definite can be assumed either by colliery owners or consumers. Prices are ruling very low for "spot" market sales; but buyers are reluctant to take up any quality that may be available.

In Lancashire last wek a moderate amount of business was done in industrial fuel, and there was a fair demand for first-class Lancashire slacks.

The approximate prices at Hull for prompt loading f.o.b. usual shipping ports are: South Yorkshire—Association (hard), 19s. 6d.; screened gas coal, 17s. 6d. to 18s.; washed trebles, 18s. 6d. to 19s.; doubles, 16s. 6d. to 17s.; singles, 15s. 6d.; smalls, 11s. to 11s. 9d.; unwashed doubles, 16s.; rough slack, 10s. to 10s. 6d.; smithy peas, 18s. 6d. to 20s. West Yorkshire—Hartleys, 16s. 6d. to 18s.; screened gas coal, 16s. 6d. to 18s.; washed trebles, 17s.; doubles, 14s. to 15s.; singles, 13s. 6d. to 14s. 6d.; smalls, 11s.; unwashed trebles, 16s. to 16s. 6d.; doubles, 12s. to 13s.; rough slacks, 9s. 6d. to 10s.; coking smalls, 8s. 6d. to 9s. Derbyshire and Notts.—Top hards, 19s. 6d.; washed trebles, 17s. to 18s.; doubles, 16s. to 16s. 6d.; singles, 15s. to 15s. 6d.; smalls, 11s.; unwashed doubles, 14s. to 14s. 6d.; rough slack, 9s. 9d. to 10s. 6d.; gas coke, 19s. to 21s.; furnace coke, 15s. 9d. to 16s. 9d.; large screened steams for bunkers, 15s. to 17s. per ton.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

Notwithstanding the shrinkage of demand, the output of Midland pits was maintained at a fair average during May. Collieries are putting forth great efforts to keep pits going through the slack season, and are offering contractors very low terms conditionally on their taking "the fat and the lean" in equal weekly consignments. These offers apply to June and July. With the co-operation of the consumer the difficulties of autumn and winter supplies might be very considerably minimized. Current buying is mostly on hand-to-mouth lines, however, though stocks might now be laid in at a cost which would show a handsome saving when compared with those which in the nature of things must prevail later. The consumer will not understand that the effect of holding off the market is to cause stringency when the normal autumn demand sets in, and collieries must then balance the account by making use of a favourable market position for all it is worth. A Birmingham merchant who sent out 3000 circulars urging customers to place their orders during the summer and offering them the full advantage of lower pithead prices received no response whatever in the case of 2996 of them. The regular summer prices notified show reductions of 1s. to 2s. a ton on rates lately ruling; but consumers who are willing to facilitate business by taking convenient deliveries in bulk can get much larger concessions. There has been little work at the pits this week.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for May 27.]

Nos. 12,874-13,540.

(BADISCHE ANILIN- UND SODA-FABRIK).—"Purification of gases." No. 13,329.

CHANCE BROS. & CO., LTD.—"Apparatus for automatically exchanging incandescent gas mantles." No. 13,222.

COPPÉE ET CIE, E.—"Coke ovens." No. 13,455

CROSLAND, E. M.—"Cut-out device for burners for mixture of gas and air." No. 13,275.

EBERLEIN, J. B.—"Gas manufacture." No. 13,083.

HEYL, G. E.—"Distillation of oil shale, coal, &c." No. 13,418.

KNIGHT, H. S.—"Spirally-guided gasholders." No. 13,251.

RADIATION, LTD.—"Gas-heated water boilers." No. 13,531.

RUDE, J.—"Carbonization of fuel." No. 13,284.

SCOTT, J. W.—See Knight, H. S. No. 13,251.

SENSICLE, L. H.—"Manufacture of tar for road-making, &c." No. 13,263.

STEERE, F. W.—"Gas manufacture." No. 13,082.

STEERE, G. R.—See Eberlein, J. B. No. 13,083.

STOBART, H. J. S.—See Chance Bros. & Co., Ltd. No. 13,222.

SUFFERN, E. S.—"Generation of water gas." No. 13,254.

YATES, H. J.—See Radiation, Ltd. No. 13,531.

Sandy Gas Exhibition.—The Directors of the Sandy Gas Company recently held a gas exhibition, in conjunction with Messrs. R. & A. Main, Ltd., in the Conservative Hall, Sandy. Lectures and cookery demonstrations were given each afternoon and evening by Miss Anstice M. Strick, M.C.A. These attracted large and appreciative audiences. A representative selection of the manufactures of Messrs. R. & A. Main was arranged round the hall.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *May* 29.

The market for pitch is quiet; and although a certain amount of interest is being displayed in next season's shipment, the prices suggested by buyers are very low and not tempting to makers. The market is nominal at about 41s. to 42s. per ton.

The demand for road tar continues strong.

Creosote remains steady at about 7d. to 7¼d. per gallon.

Solvent naphtha is firm at 1s. 8d. to 1s. 9d. per gallon for 95-160 quality. Pure benzole and pure toluole are about 1s. 11d. to 2s. per gallon.

Tar Products in the Provinces.

June 2.

There has been very little change in tar products during the past week.

In pitch there have been one or two sales reported for the forward position; but foreign buyers' ideas are lower than the tar distillers are generally willing to accept for the forward position.

Creosote is steady.

In water white products there is no change.

The average values for gas-works products during last week were: Gas-works coal-tar, 26s. 3d. to 31s. 3d. Pitch, East Coast, 40s. to 41s. f.o.b. West Coast—Manchester, 35s. to 36s.; Liverpool, 36s. to 37s.; Clyde, 39s. to 40s.; Benzole, 90 p.ct., North, 1s. 7¼d. to 1s. 8¼d.; crude, 65 p.ct. at 120° C., 11d. to 1s. 1d., naked at makers' works; 50-90 p.ct., naked, North, 1s. 7¼d. to 1s. 8¼d. Toluole, naked, North, 1s. 6¼d. to 1s. 7¼d., nominal. Coal-tar crude naphtha, in bulk, North, 7¼d. to 8¼d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 6d. Heavy naphtha, North, 1s. to 1s. 2d. Creosote, in bulk, North, liquid, 5⅝d. to 6d.; salty, 5⅝d. to 5⅞d.; Scotland, 5¼d. to 5⅝d. Heavy oils, in bulk, North, 6¼d. to 7d. Carbolic acid, 1s. 5d. to 1s. 6d. prompt. Naphthalene, £11 to £14; salts, £4 to £5, bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

BRITISH SULPHATE OF AMMONIA FEDERATION PRICES.

The British Sulphate of Ammonia Federation, Ltd., in announcing their prices for the 1925-26 season, write:

"You will observe that, in spite of the heavy reduction in price which we have decided to make, though there has been no material decrease in the price of our chief raw material, sulphuric acid, nor in our other costs of production, we have made no alteration in the amount of the commission allowed to recognized distributors. We have refrained from reducing the commission because we are anxious not to do anything which might hamper the distribution, and therefore discourage the use, of sulphate of ammonia at a time when agriculture is but slowly recovering from an acute crisis, and while British consumption of fertilizers generally is still far below the level already reached by progressive agricultural communities in other countries. It is understood that quantities purchased at the price stated below will be used for home agricultural purposes only. Prices for later months will be announced later; but we are prepared to quote for forward delivery now on application.

"We offer to sell sulphate of ammonia for home agricultural use at the following prices: For June, July, and August delivery, £12 5s. per ton for neutral quality in fine friable condition, free from lumps, basis 21·1 p.ct. nitrogen. Delivered to consumer's nearest station or wharf in Great Britain, for prompt cash payment, in lots of four tons and upwards."

Lea Bridge Capital Issue.—The £30,000 of 6 p.ct. preference stock of the Lea Bridge District Gas Company issued by Messrs. A. & W. Richards, on behalf of the Directors, was considerably oversubscribed at prices ranging from £107 down to the minimum of par.

Price of Gas at Truro.—The Truro Mercantile Association have decided to ask the Truro Gas Company to consider the matter of reducing the price of gas. Mr. J. H. Broach, who introduced the question, said they were at present paying 1s. 4d. per therm, which was equal to 6s. per 1000 c.ft.

Gas Mantles Committee.—The Committee appointed by the President of the Board of Trade to inquire into, and report upon, the application made by the Incandescent Mantle Manufacturers' Association for the imposition of a duty upon gas mantles, will hold a further public sitting for the purpose of taking evidence at 10 a.m. on Thursday, June 4, at the Board of Trade, Great George Street, S.W. 1.

Increased Price at Coventry.—The Coventry Corporation have decided to increase the price of gas by 3d. per 1000 c.ft. to prepayment meter consumers and 4d. per 1000 c.ft. to ordinary consumers. Bulk consumers above 7,500,000 c.ft. per quarter are to pay an increase of 3d. per 1000 c.ft. The reasons given for raising the price are an estimated deficiency of £19,800 on the year's working, owing to increased wages and the decrease in the value of tar products and the slump in the market for gas coke.

Padiham Gas Undertaking.—The Padiham Urban District Council have received a letter from the Ministry of Health requesting to be furnished with the Council's observations on the Assistant Auditor's report on the gas-works finances, and stating that the Ministry, in the present instance, in view of the financial position of the undertaking, would be prepared to entertain an application for sanction to borrow money in respect of the completed works. The Council, however, decided that they did not consider it desirable that the money should be borrowed; and the Clerk was instructed to reply to the Ministry accordingly.

Issue of £5 per Cent. Debenture Stock.

THE

EASTBOURNE GAS COMPANY.

(Incorporated by Special Act of Parliament 1868.)

DIRECTORS:

MR. CALEB DIPLOCK (*Chairman*).
MR. FRANK H. JONES, C.E. (*Deputy-Chairman*).
MR. BENJAMIN BRADFORD.
MR. HOWEL J. J. PRICE, D.L., J.P.
MR. CLEMENT JOHN VINALL.
MR. F. ELIOT WILLIAMS, O.B.E.

RESIDENT ENGINEER AND WORKS MANAGER:
MR. WILLIAM H. HAMMOND.

SECRETARY: MR. JAMES S. GARRARD, F.C.I.S.

AUDITORS: MESSRS. JAMES WORLEY & SONS, Chartered Accountants, London and Eastbourne.

BANKERS: BARCLAYS BANK LIMITED.

THE DIRECTORS OFFER FOR SALE BY TENDER

£50,000

5 per Cent. DEBENTURE STOCK.

The Minimum Price at which Tenders will be received is £95 per cent.

A deposit of £10 per £100 must accompany a tender, and the balance of the purchase money is to be paid by 30th June, 1925.

The Stock will carry Interest from the 1st July, 1925, and will be payable half yearly on the 1st January and 1st July.

The Stock will be registered in the Company's books and the certificates issued in the names of the purchasers or their nominees free of expense.

The Company has been incorporated for nearly 60 years, and its powers have been added to from time to time by successive Acts of Parliament, and, more recently, by Orders under the Gas Regulation Act, 1920.

The Statutory area now covers not only Eastbourne, but extends to the market town of Hailsham, together with Hellingly, Horsebridge, Westham, Hankham, Pevensey Bay, Willingdon, Wannock, Jevington, East Dean, and Polegate.

This growth of the Company's operations has necessitated considerable works extensions and the laying of many miles of mains.

The following Table indicates the Growth of the concern:

Year.	Number of Gas Consumers.	Gas Sold. Millions.
1904	7,345	353
1909	9,423	449
1914	11,365	511
1919	11,957	528
1924	13,371	555

The Authorized Capital of the Company is	**£364,000**	**0**	**0**
Of which there has been issued	325,409	11	2
Remaining to be issued	£38,590	8	10
The Authorized Loan Capital is	**£79,167**	**0**	**0**

These powers have not hitherto been used; this is the first issue of Loan Capital.

As is generally known, this Company enjoys the reputation of working upon a very low Capital; and consequently occupies a strong position financially.

This additional Capital will still leave the Company in an enviable position with respect to the amount of Capital employed as compared with similar Companies.

The Reserve and Special Purposes Funds of the Company amount to £17,114.

The amount at Credit of Profit and Loss Account is £15,834, after payment of the half-yearly dividend on the 6th March last.

Tenders for the Stock must be sent in not later than Monday, 8th June, 1925, and in the event of the receipt of Tenders for a nominal amount of Stock exceeding £50,000, Tenders at the lowest price accepted will, as far as possible, be subject to a *pro rata* diminution.

If no allotment is made, the deposit will be returned in full, and in case of partial allotment, the balance of the deposit will be applied towards payment of the remainder of the purchase money.

The Stock will be registered, and will be transferable by deed in the usual way in amounts or multiples of £50, as soon as it is fully paid.

Interest at 10 per cent. per annum will be charged on balances not paid on the due date (30th June, 1925).

Application will be made in due course to the Committee of the Stock Exchange to allow dealings in the Stock now being issued.

Copies of this Prospectus and Forms of Tender may be obtained at the Company's Offices, 87, Terminus Road, Eastbourne.

By Order of the Board of Directors,
CALEB DIPLOCK,
Chairman.

87, Terminus Road, Eastbourne,
1st June, 1925.

Tenders to be forwarded to the Secretary, Eastbourne Gas Company, in a sealed envelope marked "Tender for Debenture Stock," not later than Monday, 8th June, 1925.

The minimum amount of Stock which may be tendered for, or will be allotted, is £50 or multiples thereof.

The Stock will be registered in the Company's Books, and the Certificates issued in the name of the allottee or his or her nominee, free of all expense.

STOCK MARKET REPORT.

IGNORING the allurements of the Derby and the excitement over the Stock Exchange sweepstake, the chief feature of the Stock Markets last week was the failure of the 5 p.ct. New South Wales Loan. As we indicated last week, the more generous terms, as compared with the two previous large issues of trustee securities, were expected to attract investors, and the result, which left 68 p.ct. with the underwriters, is difficult to understand. It would be gratifying if it were clear that the monies are being used for trade expansion. Reports from industrial centres, however, though hopeful, do not appear to justify this interpretation, as the poor response is not confined to trustee securities; the underwriters of the ordinary and preference shares of Henry G. Lewis & Co. being left with about 80 p.ct. of the issue. Dealings in the new loan were recorded at $\frac{9}{16}$ discount. Some hopes are expressed of improvement in prices this week on the distribution and investment of the War Loan dividend, and the Gilt-Edged Market was steady in consequence.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. May 29.	Rise + or Fall − on Week.	Transactions Lowest and Highest Prices.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 5	5	5	Aldershot 5 p.c. max. C.	78—81	..	..
295,492	,,	,,	4	4	Do. 4 p.c. Pref.	71—76	..	..
1,551,868	,,	Apl. 2	6½	6½	Alliance & Dublin Ord.	65—70	..	..
374,000	,,	Jan. 8	4	4	Do. 4 p.c. Deb.	63—68	..	..
300,000	5	May 7	8	8	Bombay, Ltd.	4⅜—5⅛	..	5⅛
170,000	10	Mar. 5	8½	8½	Bournemouth 5 p.c.	12—13	..	..
425,050	10	,,	7	7	Do. B 7 p.c.	12½—12⅝	..	12$\frac{11}{16}$
150,000	10	,,	6	6	Do. Pref. 6 p.c.	11—12	..	11½—11$\frac{13}{16}$
50,000	Stk.	Jan. 8	3	3	Do. 3 p.c. Deb.	56—59	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	78—81	..	..
992,045	,,	Mar. 5	6$\frac{1}{16}$	6$\frac{1}{16}$	Brentford A Con.	95—100	..	95—97
990,500	,,	,,	6¼	6¼	Do. B New	93—100	..	96
76,000	,,	,,	5	5	Do. 5 p.c. Pref.	95—98	..	..
306,690	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	76—81	..	..
181,337	,,	,,	6	6	Do. 6 p.c. Rich. Red. Deb.	100—105	..	..
214,740	,,	Mar. 5	11½	12½	Brighton & Hove Orig.	165—170	..	..
244,200	,,	,,	8½	9½	Do. A Ord.	122—125	..	..
1,287,500	,,	Feb. 19	4	5	Bristol 5 p.c. max.	96½—97¼*a*	..	..
855,000	,,	Mar. 19	8	7	British Ord.	110—115	..	..
100,000	,,	Dec. 18	7	7	Do. 7 p.c. Pref.	123—128	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	72—77	..	..
100,000	10	May 21	6	8	Cape Town, Ltd.	6½—7½*	..	..
100,000	10	Apl. 23	4½	4½	Do. 4½ p.c. Pref.	6—7	..	..
150,000	Stk.	Dec. 18	4½	4½	Do. 4½ p.c. Deb.	71—76	..	..
626,860	,,	Feb. 19	6	6	Cardiff Con. Ord.	101—104	..	..
237,860	,,	Jan. 8	7½	7½	Do. 7½ p.c. Red. Deb.	104—107	..	..
157,150	,,	Feb. 19	5	6½	Chester 5 p.c. Ord.	89½—94½*b*	..	..
1,513,280	,,	Mar. 5	6	5/14/8	Commercial 4 p.c. Cap.	86—89	..	86—88
360,000	,,	,,	6	5⅜	Do. 3½ p.c. Cap.	86—89	..	..
475,000	,,	Dec. 18	3	3	Do. 3 p.c. Deb.	57—60	..	..
800,000	,,	14 Jan. 15	—	—	Continental Union, Ltd.	35—40	..	35½—36
200,000	,,	Dec. 18	7	7	Do. 7 p.c. Pref.	88—92	..	91½
660,000	,,	Mar. 5	6½	6½	Croydon sliding scale	98—102	..	99½—100½
284,975	,,	,,	5	5	Do. max. div.	83—86	..	83½
492,270	,,	Feb. 19	6	9	Derby Con.	110—112*c*	..	..
55,000	,,	Jan. 8	4	4	Do. Deb.	74—76*c*	..	..
1,002,180	1	Jan. 22	6	4	European, Ltd.	7—8	..	7—7½
16,460,070	Stk	Feb. 19	5½	5½	Gas Light & Coke 4 p.c. Ord.	83—85	..	83½—84½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	62—65	..	63—C4
4,062,235	,,	,,	4	4	Do. 4 p.c. Con. Pref.	78—80	..	79½ - 80
4,761,930	,,	Dec. 18	3	3	Do. 3 p.c. Con. Deb.	59—62	..	60¾—61½
130,000	,,	—	10	10	Do. 10 p.c. Bonds	..	..	..
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	,,	Mar. 19	6½	6½	Hastings & St. L. 5 p.c. Conv.	92—97	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	73—78	..	75½—75¾
70,000	10	May 7	10	10	Hongkong & China, Ltd.	15⅜—16⅜	..	..
86,600	Stk.	Mar. 5	10	10	Hornsey 7 p.c.	136—141	..	..
1,976,000	,,	May 21	10	59	Imperial Continental Cap.	£50—155*	−3	151—155
263,950	,,	Feb. 5	3½	3½	Do. 3½ p.c. Red. Deb.	71—74	..	..
235,242	,,	Mar. 19	6½	6½	Lea Bridge 5 p.c. Ord.	96—101	..	..
2,127,340	,,	Feb. 19	5¾	5¾	Liverpool 5 p.c. Ord.	88½—89½*b*	−½	..
600,000	,,	Mar. 19	7	7	Do. 7 p.c. Red. Pref.	103½—104½*b*	..	..
165,736	,,	Feb. 19	9	8	Maidstone 5 p.c. Cap.	122—132	..	..
63,480	,,	Dec. 18	3	3	Do. 3 p.c. Deb.	53—58	..	..
75,000	5	Dec. 4	7	5	Malta & Mediterranean	4½—4¾	..	..
541,920	Stk.	Nov. 20	4	4	Montevideo, Ltd.	66—70	..	67½—68
2,061,315	,,	Mar. 5	5	5	Newcastle & Gateshead Con.	77½—78*d*	..	..
300,929	,,	,,	4	4	Do. 4 p.c. Pref.	76—77*d*	+3	..
529,705	,,	Dec. 18	3½	3½	Do. 3½ p.c. Deb.	68½—69½*d*	..	..
15,000	,,	Mar. 5	11	12	North Middlesex 10 p.c.	..	..	..
75,940	,,	,,	7$\frac{7}{10}$	8$\frac{2}{5}$	Do. 7 p.c.	..	..	..
300,000	Stk.	May 7	9	7	Oriental, Ltd.	100—105	..	104½—105
188,120	,,	Jan. 8	7⅛	7⅛	Plym'th & Ston'house 5 p.c.	109—114	..	..
60,000	50	Mar. 5	13	14	Portsea Island B	96—99	..	..
100,000	50	,,	12	13	Do. C	93—98	..	..
2,289,909	1	—	—	—	Primitiva Ord.	9/6—10/6	+-/6	9/-—10/-
311,100	100	Dec. 1	4	4	Do. 4 p.c. Red. Deb.	79—81	..	..
600,000	Stk.	Jan. 22	4	4	Do. 4 p.c. Red. Deb. 1911	64—66	..	65½
220,335	,,	Dec. 18	4	4	Do. B. Aires 4 p.c. Rd. Db.	65—67	..	..
321,670	,,	,,	4	4	Do. R'r P'te 4 p.c. Rd. Db.	65—67	..	..
150,000	10	Mar. 19	6	6	San Paulo 6 p.c. Pref.	7⅛—8⅛	..	8$\frac{1}{16}$—8⅛
125,000	50	Jan. 2	5	5	Do. 5 p.c. Red. Deb.	43—46	..	..
270,000	Stk.	Mar. 19	5⅛	5⅛	Sheffield A	103—105*e*	..	..
419,968	,,	,,	5⅛	5⅛	Do. B	103—105*e*	..	..
1,047,000	,,	,,	5⅛	5⅛	Do. C	103—105*e*	..	..
90,000	10	Oct. 23	8	6	South African	7—9	..	..
6,609,895	Stk.	Feb 19	5	6½	South Met. Ord.	93—95	..	93½—94½
1,895,445	,,	Jan. 8	3	3	Do. 3 p.c. Deb.	59—62	..	60½
734,000	,,	Mar. 5	6½	6½	Do. 6½ p.c. Red. Deb.	102½—104½	..	104
91,500	,,	Mar. 5	8½	8½	South Shields Con.	135—136*d*	..	..
1,187,795	,,	Feb. 19	6½	6½	South Suburban Ord. 5 p.c.	95—98	..	95
368,837	,,	Dec. 18	5	5	Do. 5 p.c. Deb.	97—100	..	..
647,740	,,	May 7	5	5	South'mpt'n Ord. 5 p.c. max.	81—84	..	..
121,275	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	72—77	..	..
250,000	,,	Mar. 5	7	7	Swansea 7 p.c. Red. Pref.	102—104	..	..
200,000	,,	Dec. 18	6½	6½	Do. 6½ p.c. Red. Deb.	103—105	..	..
120,000	,,	Feb. 19	8	8	Tottenham District A 5 p.c.	116—119	..	..
882,275	,,	,,	6½	6½	Do. B 3½ p.c.	95—98	..	95
150,000	,,	—	—	—	Do. 5½ p.c. Pref.	103—105	..	104½
181,255	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	77—80	..	..
258,251	,,	Mar. 19	5	5	Tynemouth Con. and New Uxbridge, Maidenhead, & Wycombe 5 p.c.	74—76*d*	..	..
197,294	,,	Feb. 19	6½	6½		95—100	..	..
88,330	,,	,,	5	5	Do. 5 p.c. pref.	95—100	..	..
91,800	,,	,,	—	6½	Do. 5 p.c. Maidenh'd	90—95	..	..
					Wandsworth, Wimbledon, and Epsom—			
30,000	,,	Mar. 5	9½	9½	Wandsworth A 5 p.c.	130—135	..	..
255,636	,,	,,	7½	7½	Do. B 3½ p.ct.	110—115	..	112½—113½
392,955	,,	,,	6/9/6	6/9/6	Do. C and New	95—100	..	..
352,000	,,	,,	7½	7½	Wimbledon 5 p.ct.	105—110	..	..
98,000	,,	,,	7½	7½	Epsom 5 p.ct.	112—117	..	..
88,416	,,	Dec. 18	3	3	3 p.c. Deb.	57—60	..	..

Quotations at :—*a*,—Bristol. *b*,—Liverpool. *c*,—Nottingham. *d*,—Newcastle. *e*,—Sheffield. * Ex. div.

In the Foreign Market German 7 p.ct. were marked up ½ to par, and French Bonds were a little better. Home Rails continued a friendless market. There were some uncertain movements in the Oil Market, which will not be improved by the rumours in certain quarters of a possible reduction shortly in the price of both crude oil and petrol. Rubber shares, due to a further improvement of the raw material, which now stands at 2s. 10½d. per lb., were buoyant, and several appreciable increases occurred in the quotations.

The Gas Market was quieter than usual. There were fewer transactions recorded, and the only quotations varied on the London Exchange were a further fall of 3 points on Imperial Continental Ordinary, and a rise of 6d. on the Primitiva Ordinary. An addition to the List is made this week by the inclusion of the Tottenham and District £150,000 5½ p.ct. Preference Stock.

The following transactions were recorded during the week:

On Monday, Bombay 5⅛, Bournemouth "B" 12$\frac{11}{16}$, Brentford "A" 96, Commercial 4 p.ct. 88, Continental Union 36, European 7, 7¼, Gas Light and Coke 83⅜, 84¼, 4 p.ct. preference 79¼, 80, 3 p.ct. debenture 61¼, 61½, Imperial Continental 154½, 155 *ex* div., Montevideo 67½, Primitiva 4 p.ct. debenture (1911) 65½, South Metropolitan 3 p.ct. debenture 60¼, Tottenham "B" 95.

On Tuesday, Bournemouth "B" 12$\frac{11}{16}$, Commercial 4 p.ct. 87, Croydon maximum dividend 83½, Gas Light and Coke 83½, 84⅜, 84¼, 3½ p.ct. maximum 64, 4 p.ct. preference 79⅛, 3 p.ct. debenture 60⅜, 61, Imperial Continental 154 *ex* div., Montevideo 68, Primitiva 9s. 7½d., 9s. 9d., San Paulo 6 p.ct. preference 8$\frac{1}{16}$, 8⅛, South Metropolitan 6½ p.ct. debenture 104. Supplementary prices, Hornsey 4 p.ct. debenture 75, Montevideo 5 p.ct. 1st mortgage debenture 75.

On Wednesday, Bournemouth "B" 12½, 12$\frac{11}{16}$, 6 p.ct. preference 11½, 11$\frac{9}{16}$, Brentford "A" 97, Continental Union 7 p.ct. preference 91½, Gas Light and Coke 83½, 83¾, Imperial Continental 154 *ex* div., Oriental 104½, 105, Primitiva 9s. 6d., 9s. 7½d., 9s. 9d., South Metropolitan 93½, 94½, 94½, 6½ p.ct. debenture 104, Wandsworth "B" 113¼.

On Thursday, Brentford "A" 95½, "B" 96, Commercial 4 p.ct. 87, Continental Union 35¼, Croydon sliding-scale 99½, 99⅝, 100½, Gas Light and Coke 83½, 83¾, 84, 84¼, Imperial Continental 153, 155 *ex* div., Primitiva 9s., 9s. 4½d., 9s. 9d., 9s. 10½d., 10s., South Metropolitan 93⅜, 94½, Tottenham 5½ p.ct. preference 104¼, Wandsworth "B" 112½. Supplementary prices, Hornsey 4 p.ct. debenture 76½.

On Friday, Commercial 4 p.ct. 86, Croydon sliding-scale 99½, 99⅝, 100½, Gas Light and Coke 84⅜, 84¼, 3½ p.ct. maximum 63, 63⅜, 63⅞, Hastings and St. Leonards 3½ p.ct. 75¼, 75½, Imperial Continental 151, 152, 153, 154 *ex* div., South Metropolitan 93¾, 94½, South Suburban 96.

In Lombard Street money was considerably easier, and a further general decline occurred in both loan and discount rates. The charge for renewing day-to-day loans after touching 4½ p.ct. finally closed at 4 and 3⅜ p.ct. The Treasury Bill average rate dropped a little over 3s. 1d. on the week to £4 6s. 4·48d. p.ct.

In the Foreign Exchange Market French francs were erratic, and at one time touched 97.45, finally closing at 96.90. Belgian exchanges as usual rose in sympathy, and closed at 99.25. Italian lire, on the other hand, appreciated slightly, and closed on Friday at 121.69. Sterling was generally firm; and on Thursday touched the highest price since the war. The week closed at 4.86⅜.

Silver was firm on Indian support at 31⅜d. per oz. There was no gold available, the price nominally being 84s. 11½d. per oz.

The Bank Rate is 5 p.ct., to which it was raised from 4 p.ct. on March 5. Bankers' deposit rates are 3 p.ct. The deposit rates of the discount houses are 3 p.ct. at call and 3½ p.ct. at notice.

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